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DISEASES CAUSED BY BACTERIA AND FUNGI

EVANS, J. B., & NIVEN, C. F., JR. (1950.) **A comparative study of known food-poisoning staphylococci and related varieties.**—*J. Bact.* **59.** 545–550. [Authors' summary copied *verbatim.*] **2479**

A physiological study has been conducted on 114 staphylococci, including 22 strains that were known to produce enterotoxin as evidenced by feeding tests with rhesus monkeys. Based upon the 29 physiological tests employed, the enterotoxigenic strains comprised an extremely homogeneous group. All toxigenic cultures were coagulase-positive and appeared to be identical with all of the other coagulase-positive strains, which included 8 cultures that failed to give evidence of enterotoxin production. These studies indicate that most, if not all, enterotoxigenic staphylococci are members of the coagulase-positive group, but they do not preclude the possibility that some varieties of coagulase-negative staphylococci might also be associated with food poisoning.

MUNCH-PETERSEN, E., & CHRISTIE, R. (1947.) **On the effect of the interaction of staphylococcal β toxin and group-B streptococcal substance on red blood corpuscles and its use as a test for the identification of** *Streptococcus agalactiae.*—*J. Path. Bact.* **59.** 367–371. [Authors' summary copied *verbatim.*] **2480**

A test is described for identifying colonies of *Streptococcus agalactiae* on agar plates containing sheep or ox blood by the addition of staphylococcal β toxin. In less than two hours at 37° C. such colonies will lyse the red cells to a distance of 10 mm. within the area covered by the toxin.

BRYAN, C. S., LABRANCHE, V. P., & DRURY, A. R. (1950.) **Penicillin-streptomycin bougies in the treatment of acute infectious mastitis.**—*N. Amer. Vet.* **31.** 20–25. **2481**

Penicillin and streptomycin, singly or together, were relatively non-irritating to udder tissue, as judged by comparative leucocyte counts, when given in a liquid or bougie form. Immediate treatment of acute mastitis with a bougie containing 50,000 units each of both antibiotics was effective in treating nine cases of acute coliform, one of staphylococcal and six of acute streptococcal mastitis. One bougie was inserted each day into the affected quarter. Eighteen chronic cases of streptococcal mastitis were also treated successfully with the bougies.—MALCOLM WOODBINE.

HECKLY, R. J., & GOLDWASSER, E. (1949.) **Studies on infection with** *Bacillus anthracis.* **VIII. The production of an immunizing antigen** *in vitro.*—*J. infect. Dis.* **84.** 92–97. **2482**

The medium is a mixture of ox serum ultrafiltrate, containing a dialysable component and a fraction of sheep serum separated in an electrophoresis apparatus; the latter is a non-dialysable component with electro-chemical properties similar to albumin, not the native albumin in sheep serum fraction V, but a more stable component associated with this albumin.—W. R. BETT.

FONTES-MAGARÃO, M., FERNANDES, R., & DAUSTER, J. (1947.) Sôbre a presença de um bacilo tuberculoso tipo aviário atenudado, isolado a partir de um gânglio mesentérico proveniente da clínica humana. [**An attenuated avian type tubercle bacillus isolated from a human mesenteric lymph node.**]—*Clin. Tisiol.* **2.** 359. [Abst. in *Amer. Rev. Tuberc.* **61.** 45. (1950), copied *verbatim.* Signed: A. A. MOLL.] **2483**

An enlarged mesenteric node removed at autopsy [from a human being—Ed. *V. B.*] contained an acid-fast organism with properties differing from those of human-type tubercle bacilli. The results of inoculation into guinea pigs, rabbits, and chickens, as well as the staining, morphological, and pathological characteristics, identified the organism as an attenuated form of the avian tubercle bacillus. This is the first instance of its kind in Brazil although similar findings have been reported both from Europe and the United States.

SOLTYS, M. A., & JENNINGS, A. R. (1950.) **The dissemination of tubercle bacilli in experimental tuberculosis in the guinea pig.**—*Amer. Rev. Tuberc.* **61.** 399–406. [Spanish summary. English summary copied *verbatim.*] **2484**

The dissemination of tubercle bacilli has been examined in guinea pigs infected experimentally with human-type bacilli from tuberculous organs or with a culture of bovine type tubercle bacilli. It was found that, the heavier the inoculum, the greater and the quicker the rate of spread of the bacilli in the body.

Tubercle bacilli were discovered in the majority of the organs one hour after subcutaneous inoculation. The brain appeared to be the last organ invaded. Examinations of the blood revealed that tubercle bacilli were present in the first few hours after inoculation and thereafter only at irregular intervals.

The earliest microscopic changes appeared in the lymph nodes and the spleen at twenty-four hours, and in the liver at forty-eight hours, after infection. The first definite microscopic tubercles were present in the inguinal lymph node at sixty-four hours, in the spleen at seventy-two hours, and in the liver at four days after infection. No gross or microscopic lesions were observed in the other organs in the first few days after inoculation.

BEATTIE, M. (1949.) **Cultivation of *Mycobacterium tuberculosis*. A comparison of hydrochloric acid and trisodium phosphate in the preparation of sputum and of the use of fluid Dubos-Davis medium and Petragnani medium.**—*J. Lab. clin. Med.* **34.** 733–738. **2485**

In sputum specimens so heavily infected that negative results were unlikely, trisodium phosphate treatment affected the organisms somewhat adversely with regard to growth in cultures as compared with hydrochloric acid treatment. Dubos-Davis and Petragnani media were equally satisfactory for cultivation.—R. MARSHALL.

ARONSON, J. D., & SCHNEIDER, P. (1950.) **The problem of standardization of BCG vaccine.**—*Amer. J. publ. Hlth.* **40.** 533–544. [Authors' summary copied *verbatim.*] **2486**

While the colonial and antigenic characteristics of the BCG culture may vary, we have not observed any evidence of increased virulence. Six cultures of BCG obtained from different laboratories both in the United States and abroad are uniformly avirulent, and there is no evidence that the cultivation on bile-containing medium increases the virulence of the culture. The nature of the local lesions in animals following administration of the BCG culture varies with the natural resistance of the animals. The persistence of the tuberculin reaction in man, following the intracutaneous injection of BCG vaccine, is not correlated with the age of the culture nor with the number of generations for which the culture has been maintained on bile-free medium. The instability of the tuberculin reaction following BCG vaccination is correlated to some degree with geographical location.

The viability of the organisms in BCG vaccine after 5 to 7 days decreases rapidly and continues to decrease with increasing age, as indicated by cultural methods, tuberculogenic property, and oxygen consumption. Lyophilization reduces immediately the number of viable organisms present in BCG vaccine. Mice can be protected by BCG vaccine against a challenge dose of virulent tubercle bacilli.

The universal use of BCG vaccine and its manufacture by commercial organizations should depend on stabilization of the vaccine and development of standards based on protection tests with suitable animals.

SIKES, D., & GROTH, A. H. (1950.) **Studies with the johnin and tuberculin intradermal tests in cattle naturally infected with *Mycobacterium paratuberculosis* (Johne's disease).**—*Amer. J. vet. Res.* **11.** 181–187. [Authors' summary copied *verbatim.*] **2487**

A total of 855 mammalian tuberculin intradermal tests were made on cattle naturally infected with Johne's disease. A comparison of the tests made on the caudal fold (continuously used area) and those on the neck region (unused area) are given and support the following conclusions: (1) That animals infected with Johne's disease are sensitive to mammalian tuberculin. (2) The sensitivity seems to persist in many animals for many months, and positive reactions in many instances remain seventy-two hours or longer after injections are made.

WEITZ, B. (1949.) *C. pyogenes* **infection in cattle with special reference to summer mastitis.**—*Vet. Rec.* **61.** 123–126. **2488**

Using 450 cattle from 19 herds in field trials on the protection of cattle against summer mastitis caused by *Corynebacterium pyogenes*, by the inoculation of toxoid, vaccine, and toxoid plus vaccine, the numbers of cases occurring in the treated groups were approximately equal to the numbers occurring in control groups. The breakdown in immunity did not appear to be the result of a failure in antibody formation as the majority of animals injected with toxoid, including some of the cows which developed the disease, had high blood titres of antitoxin. Possible reasons for the failure of these protective measures are discussed.

Treatment of cases by a variety of methods also gave negative results—ANGUS FOGGIE.

MORSE, E. V. (1950.) **An ecological study of** *Corynebacterium renale*.—*Cornell Vet.* **40.** 178–187. [Author's summary copied *verbatim*.] **2489**

Corynebacterium renale was isolated from the urine of 17·6 per cent of 523 apparently normal dairy cattle. The median carrier incidence in ten herds in which there had been a number of pyelonephritis cases was 22·7 per cent. The median carrier incidence in six herds in which no clinical cases had been observed during a two-year period was 6·7 per cent. Two of the bacteriologically positive animals exhibited clinical manifestations of pyelonephritis four months after bacteriological examination.

Periodic examinations of a 100-cow dairy herd led to the conclusion that *C. renale* was being disseminated from the carrier cows to their close neighbors. Of all animals from which *C. renale* was isolated in the absence of clinical symptoms (carrier), 51 per cent showed the organism on at least two tests.

Cultures were made from vaginal or penile swabs and aspirated bladder urine of 108 normal cattle immediately after slaughter. The swab cultures proved positive for *C. renale* in four instances, but no diphtheroid bacilli were isolated from the bladder urine.

I. CONLON, J. B. (1949.) **Penicillin in the control of swine erysipelas. [Correspondence.]** —*Vet. Rec.* **61.** 874. **2490**

II. BROWN, K. E. (1949.) **Penicillin in the control of swine erysipelas. [Correspondence.]**—*Ibid.* 874. **2491**

III. CHESTER, W. R., & GEE, B. G. (1949.) **Penicillin in the control of swine erysipelas. [Correspondence.]**—*Ibid.* 874. **2492**

I. A single injection of 400,000–1,000,000 units of penicillin mixed with swine erysipelas serum was usually sufficient and was more effective than when either agent was used alone.

II. A single injection of 125,000–1,000,000 units of penicillin in ethyl oleate was usually sufficient; the results were as good as those obtained with swine erysipelas serum.

III. An injection of 400,000 units of penicillin repeated after 24 hours gave good results in pigs when the disease was in an early stage; further daily doses might be necessary in more advanced cases. Results were more satisfactory than those obtained with serum.—R. MARSHALL.

JAWETZ, E. (1950.) **A pneumotropic pasteurella of laboratory animals. I. Bacteriological and serological characteristics of the organism.**—*J. infect. Dis.* **86.** 172–183. [Author's summary copied *verbatim*.] **2493**

In the course of rapid serial passage of mouse lung, pneumonic lesions were encountered. A pasteurella-like organism was regularly recovered from the lesions and shown to be responsible for the disease process. Bacteriological and serological studies indicated that the pasteurella was not identical with any known species. Its outstanding characteristic was its striking pneumotropism in mice, producing no lesions in any organ except the lung after inoculation by any route. Therefore the name of *Pasteurella pneumotropica* is proposed for this bacterium.

Mice from a number of mouse colonies in the eastern United States were shown to carry the organism latently in their respiratory tract. No spontaneous epizootics have been noticed in these colonies for several years. Pathogenicity of latent *P. pneumotropica* appears to be a function of intranasal passage of mouse lung material. The organism was also recovered from the respiratory tract of other small laboratory animals, but no lesions could be induced in them. It is suggested that *P. pneumotropica* is related to other *Pasteurella* species found in mice and that its peculiar characteristics may have evolved in the course of adaptive changes in host and parasite.

JAWETZ, E., & BAKER, W. H. (1950.) **A pneumotropic pasteurella of laboratory animals. II. Pathological and immunological studies with the organism.**—*J. infect. Dis.* **86.** 184–196. [Authors' summary copied *verbatim*.] **2494**

The pathological changes in *Pasteurella pneumotropica* infection are described. The organisms produce lesions only in the lungs following intranasal inoculation. There is a bronchopneumonia progressing to necrosis of the exudate and formation of abscesses. The latter persist and become encapsulated while the remainder of the consolidated areas resolve and regain their normal appearance.

The most severe illness and the highest number of deaths occurred on the second and third day after inoculation when the largest areas of lung tissue were involved and unaerated. Very marked leukopenia indicated toxic depression. Necrotic nodules persisted in the lungs for many weeks, without any evidence of illness.

The organism appears to spread from mother to offspring by the respiratory route. The natural spread is not of sufficient magnitude ever to result in spontaneous illness. Streptomycin treatment permits elimination of *P. pneumotropica* from a mouse stock kept in isolation. The offspring of pasteurella-free mice are definitely less susceptible

to superinfection with *P. pneumotropica* than the offspring carrying the organism.

The presence of latent *P. pneumotropica* in the respiratory tract increases susceptibility to superinfection by the intranasal route, while parenteral injection of similar bacterial suspensions decreases it. Possible explanations for this observation are discussed. The relative resistance of young mice to *P. pneumotropica* infection is not due to subclinical immunization but rather to nonspecific hereditary factors.

MORENG, R. E., & SHAFFNER, C. S. (1950.) **The ineffectiveness of modified thyroidal activity on resistance of chickens to fowl cholera.**—*Cornell Vet.* **40.** 136–140. [Authors' summary copied *verbatim.*] **2495**

A total of 211 birds was used in four different trials to test the effect of altered thyroidal activity on resistance of the domestic fowl to fowl cholera. Hypothyroid and hyperthyroid conditions were created through the administration of thiouracil, thyroprotein, or thyroxine. The evidence obtained indicates that altered thyroidal activity had little or no influence on the resistance of the birds to fowl cholera.

WINDLE, W. F., CHAMBERS, W. W., RICKER, W. A., GINGER, L. G., & KOENIG, H. (1950.) **Reaction of tissues to administration of a pyrogenic preparation from a pseudomonas species.**—*Amer. J. med. Sci.* **219.** 422–426. [Authors' summary copied *verbatim.*] **2496**

The administration of massive doses of a purified extract of a Pseudomonas species and the repeated administration of the drug to 7 rabbits, 8 guinea pigs, and 1 monkey induced no striking pathological changes. A variable, although never great, amount of cloudy swelling was encountered in the kidneys.

Histological changes in the suprarenal glands, lymphoid and myeloid organs were encountered in all animals receiving this extract but were not observed in those receiving pyrogen-free saline solution. The principal changes were: increased production of macrophages and initiation of production of myelocytes and granulocytes in the spleens of rabbits receiving prolonged treatments. The suprarenal cortex appeared to have undergone some hypertrophy.

O'CONNOR, J. G. (1949.) **Streptomycin in joint-ill.**—*Irish vet. J.* **3.** 391–392. **2497**

After unsuccessful treatment with penicillin, two foals with joint-ill were given streptomycin hydrochloride intramuscularly at 12-hour intervals (1–2 g.). The condition of the foals improved and except for some swelling of the affected joint returned to normal.—R. MARSHALL.

FIELD, H. I. (1949.) **The examination of bile samples as a means of assessing the incidence of salmonella infection in cattle.**—*Vet. Rec.* **61.** 275–278. **2498**

Bile samples from all cattle entering certain chosen knackeries in South Wales and border counties were examined for salmonella during June–November inclusive of 1947 and 1948. The results for each knackery are tabulated, mapped, and discussed.

A list of types, and frequency, of salmonella organisms identified is given and an attempt made at assessing the economic importance of the disease in an endemic area.

The survey allows of a comparison between the incidence of salmonellosis as ascertained by laboratory examination of material from practitioners in these areas, with material from knackeries and also the detection of salmonellosis in areas thought to be free.—F. W. JORDAN.

BAKKEN, K., & VOGELSANG, T. M. (1950.) **The pathogenesis of *Salmonella typhimurium* infection in mice.**—*Acta path. microbiol. scand.* **27.** 41–50. [In English. Authors' summary slightly modified.] **2499**

The authors found that when mice are infected by the mouth with *S. typhimurium*, a moderate but characteristic inflammatory reaction is provoked in the intestinal mucosa. The bacteria are carried by the portal vein to the liver where they are demonstrable from the third day onwards. After the bacteria have reached the liver, its parenchyma shows characteristic histological lesions with necrosis of the liver cells and proliferation of the cells in the macrophage system. Throughout the whole of their series of experiments they observed this parallelism between the positive bacteriological findings and the histological changes.

S. typhimurium does not reach the gall-bladder till lesions have developed in the liver. This suggests that the bacteria reach the gall-bladder from the liver after it has been damaged and become the seat of necroses. It is through these necrotic foci that the living bacteria pass over from the blood to the bile capillaries and thence through the bile passages with the bile to the gall-bladder.

BROOKE, C. O. S. B., DOUGLAS, H., & TAYLOR, J. (1950.) **A case of *Salm. typhi-murium* infection possibly contracted from a hen, with a note on the finding of *Salm. thompson* in the blood of hens.**—*Mon. Bull. Minist. Hlth publ. Hlth Lab. Serv.* **9.** 128–132. [Authors' summary copied *verbatim.*] **2500**

A severe case of gastro-enteritis due to *Salm. typhi-murium* in a boy aged two years is described. Infection was possibly conveyed by eggs from a sick hen, kept with two others in a yard at the boy's

house. *Salm. typhi-murium* was isolated from a blood clot from this hen and from the caecal contents after death. *Salm. thompson* was also isolated from the blood clot of this bird and from one of the others. No salmonellae were obtained from the eggs of any of the hens. It is suggested that the possible role of back-yard poultry in the spread of salmonella infections is worthy of further investigation.

OLSON, T. A., & RUEGER, M. E. (1950.) **Experimental transmission of *Salmonella oranienburg* through cockroaches.**—*Publ. Hlth Rep., Wash.* **65.** 531–540. [Authors' summary slightly modified.] **2501**

In an effort to extend the available knowledge concerning insect-borne diseases and more specifically to attempt an evaluation of the role of cockroaches as carriers of food poisoning or food infection organisms, a series of transmission experiments was undertaken with *S. oranienburg* as the pathogen and three common species of household roaches as potential carriers.

Survival of the pathogen in the insects was determined by an examination of the feces. It was found that under the conditions of these experiments the test strain of *Salmonella* could survive for 10 days in the American roach (*Periplaneta americana*), for 12 days in the German roach (*Blatella germanica*), and for 20 days in the Oriental cockroach (*Blatta orientalis*). A post-mortem examination of the Oriental roach showed that it was positive 42 days after an infective feeding, even though it had passed contaminated feces only during the first 20 days.

Supplementary experiments with the American roach have resulted in the accumulation of other information which is pertinent to the problem. Carmine and acriflavine were eliminated from the digestive tract of roaches approximately 6 days after feeding, indicating roughly the time required for mechanical clearing of the digestive system. Fecal pellets from an experimental roach have remained infective for a period of 199 days at room temperature, while organisms from a culture have survived on glass surfaces for 34 days, on ordinary soda crackers for 88 days, and on corn flakes for 62 days. On the relatively smooth pronotum of the roach, the organisms have been viable for 78 days. Through mouth contact, watering tubes of the roach have been contaminated at least 4 days after the infective feeding, and organisms have survived on the cotton wick of the water device for 15 days.

PIOTROWSKI, J. (1949.) Badania krwi kur na odczyn aglutynacyjny przy zwalczaniu białej biegunki piskląt w latach 1946–49 w Woj. Zakładzie Higieny Weterynaryjnej w Warszawie. **[Agglutination test in control of *Salmonella pullorum* infection of poults.]**—*Med. weteryn.* **5.** 909–915. [Abst. from English summary.] **2502**

In agglutination tests for *S. pullorum* infection on the blood of 15,695 birds in the course of three years on large breeding farms in the Warsaw district 6% reacted in 1946–47, 12% in 1947–48, and 16% in 1948–49. Haemolysis of the samples did not affect the results of the agglutination tests.

GWATKIN, R. (1950.) **Studies in pullorum disease. XXV. Observations on the use of streptomycin in *Salmonella pullorum* infection in chicks by the oral and intraperitoneal routes.**—*Canad. J. comp. Med.* **14.** 157–161. [English and French summaries. English summary copied *verbatim*. For part XXIV, see *V.B.* **20.** 195.] **2503**

Crude streptomycin sulphate in the drinking water was not toxic for chicks when given in a dosage to supply 10,000 micrograms of streptomycin base per chick/day. Its efficiency was not determined owing to failure of the test culture.

The mortality in chicks treated at time of infection with 10,000 micrograms of streptomycin per day in the drinking water was 15 per cent, while in the untreated group it was 57·5 per cent. Four of the survivors in each group were positive by aggutination tests at 105 days and *S. pullorum* was isolated from six.

The mortality in chicks treated after symptoms had developed was 78·3 per cent in those receiving streptomycin in the drinking water, 90·4 per cent in those that had daily intraperitoneal injections, and 85·3 per cent in the untreated birds.

BRYAN, H. S., LINK, R. P., & ALBERTS, J. O. (1950.) **The clearing of cloudy turkey serum for the pullorum disease tube agglutination test.**—*Poult. Sci.* **29.** 167–170. [Authors' summary slightly amended.] **2504**

Turkey blood samples of which the serum is cloudy cannot be used in the pullorum disease tube agglutination test. The cloudiness is due to the high concentration of lipid material which is present in the blood of laying hens. The lipid material interferes with the reading of the results of the agglutination test.

A method is described for extracting the lipid material from cloudy serum with ethylene dichloride so that the agglutination test can be run on the serum. The extraction process does not significantly affect the *Salmonella pullorum* antibody titer.

KIRSBAN, N. J., & FOSHAY, L. (1946.) **Tularemia acquired from the pheasant.**—*J. Amer. med. Ass.* **131.** 1493–1494. [Authors' summary copied *verbatim*.] **2505**

In the second case of tularemia acquired from

the pheasant to be recorded, after a minimal incubation period of six days the typhoidal clinical type with tularemic pneumonia and pleurisy with effusion was presented. Recovery followed the administration of hyperimmune serum and streptomycine. Combined therapy was not planned and it is not recommended.

JONSEN, J., & THJÖTTA, T. (1948). **Studies on** *Bacteroides*. **II.** *B. funduliformis* **and its relation to** *Necrobacterium necrophorus* (*Actinomyces necrophorus.*)—*Acta. path. microbiol. Scand.* **25.** 688–702. [In English.] **2506**

The authors have examined strains of *Bacteroides funduliformis* [the origin of these strains is not stated; presumably they were isolated from human beings] and conclude that this organism is identical with *Fusiformis necrophorus* in morphological, biochemical, and cultural characters. The serological characters have not yet been examined.

—M. C.

LINDLEY, D. C. (1948.) **Sodium sulfamethazine in treatment of** *Actinomyces necrophorus* **infections of the bovine foot.**—*J. Amer. vet. med. Ass.* **113.** 465–467. **2507**

L. treated 27 cases of foot rot in cattle by the intravenous administration of sodium sulphamethazine. The dose varied from 3 to 10 grammes per 100 lb. body weight and one injection sufficed, except in two cases on the lowest dosage rate which were re-treated after one week.

In most cases recovery from lameness had occurred by the third day. No toxic reactions to the drug were observed in this series of cases although two instances of non-fatal shock were reported following intravenous injection of sodium sulphamethazine in cases other than foot rot. The shock symptoms may be caused by acute alkalosis.

—E. J. H. FORD.

FURCOLOW, M. L., & RUHE, J. S. (1949.) **Histoplasmin sensitivity among cattle.**—*Amer. J. publ. Hlth.* **39.** 719–721. **2508**

The skin sensitivity of Kansas cattle to histoplasmin (an extract of the fungus *Histoplasma capsulatum*), carried out simultaneously with tuberculin testing, revealed that the geographical distribution of reactors resembled that of histoplasmin reactors in the human population. Also, reaction rates between cattle and children of the same ages showed marked similarities.

—GEORGE M. URQUHART.

TRAUB, E. F., & SCHULTHEIS, D., JR. (1949.) **Gassing of fungi. A preliminary report.**—*Arch. Derm., Chicago.* **60.** 272–276. [Abst. in *Bull. Hyg., Lond.* **25.** 36. (1950), copied *verbatim.* Signed: G. C. AINSWORTH.] **2509**

Having ascertained experimentally that *Microsporum audouini*, *Microsporum lanosum* [*M. canis*], *Trichophyton purpureum* [*T. rubrum*], and *T. gypseum* [*T. mentagrophytes*] are killed by a 30-minute exposure to chlorine gas, the authors express the belief that chlorine can be used effectively in the treatment of fungus infections of the glabrous skin and scalp.

REINHARD, K. R., TIERNEY, W. F., & ROBERTS, S. J. (1950.) **A study of two enzootic occurrences of bovine leptospirosis.**—*Cornell Vet.* **40.** 148–164. [Authors' summary copied *verbatim.*] **2510**

Bovine leptospirosis has been observed in two herds of cattle in central New York State. Symptoms in adult cattle varied from hemoglobinuria, icterus, emaciation, and interrupted lactation to depressed lactation with thickened milk. In calves the symptoms varied from hemoglobinuria and death to intermittent albuminuria.

Leptospirae were isolated in pure culture from members of each herd. The details of laboratory diagnosis and clinical histories are given. The significance of the carrier state and problems of its detection and eradication are discussed.

RECEVEUR, P. (1949.) Péripneumonie contagieuse des bovidés en Afrique Centrale Française, epizootologié — mesures de protection sanitaire et médicale. [**Bovine contagious pleuro-pneumonia in French Central Africa.**]—*Bull. Off. internat. Epiz.* **32.** 122–147. **2511**

This is an account of the distribution of bovine contagious pleuro-pneumonia in French Central Africa and a discussion of the factors which affect its persistence and spread. The chronic nature of the disease, the existence of "carriers", seasonal movements of herds and the social customs of the African cattle owners are the main difficulties which beset any programme of control and eradication. The last factor is the most important and it will take generations of slow and patient teaching to introduce effective measures of control.

The provision of water supplies so as to avoid the need for extensive cattle movements is necessary. Instruction of the African cattle owners in the methods of spread of the disease is a slow but worth-while long-term policy, to be linked with the provision of an adequate staff of "sanitary police". Finally, there is need for research to devise a simple and rapid diagnostic test and to produce an efficient vaccine which can be used under field conditions.

—E. G. WHITE.

DAVIS, F., & SOLOWEY, M. (1950.) **The utilization of some organic compounds by one strain each of** *Salmonella anatum*, *Salmonella*

oranienburg, **and** *Salmonella pullorum*.—*J. Bact.* **59.** 361–366. [Authors' summary copied *verbatim*.] **2512**

During a 168-hour experimental period a strain of *Salmonella anatum* and *Salmonella oranienburg* readily utilized as energy sources for growth DL-*alpha*-alanine, asparagine, and sodium citrate in a basal salt medium. *S. anatum* also utilized glycerol and lactic acid and gave variable growth responses with sodium acetate and succinic acid. A variable response was also obtained with *S. oranienburg* in the media supplemented with sodium acetate, glycerol, lactic acid, and succinic acid. None of the compounds tested supported growth of a strain of *Salmonella pullorum*, but viable organisms occasionally survived through the first subcultures in asparagine and sodium citrate media.

See also absts. **2582** (*Pf. mallei* and *Pf. whitmori*); **2583** (*Brucella abortus*); **2663** (*Pasteurella multocida*); **2664** (*Streptomyces venezuelae*); **2700–1** (salmonella food poisoning); **2702** (enterococci); **2711–12** (bacteria in milk). **2736** (simultaneous complement-fixation for dourine and glanders); **2741** (report, New Zealand).

DISEASES CAUSED BY PROTOZOAN PARASITES

WILSON, S. G. (1949.) *Trypanosoma uniforme-Trypanosoma vivax* **infections in bovines and** *Trypanosoma uniforme* **infections in goats and sheep at Entebbe, Uganda.**—*Parasitology.* **39.** 198–208. **2513**

W. confirms earlier work that *T. uniforme* must be regarded as distinct from *T. vivax*, and describes a mixed *T. uniforme–T. vivax* infection in cattle in which *T. uniforme* always appeared as the dominant trypanosome.

A *T. uniforme* infection in a goat, produced by subinoculation, took the form of a series of relapses, the trypanolytic action of the blood producing many grotesque and disintegrating forms in each relapse. In cattle, sheep, and goats, a constant form of binary fission is described.

—G. M. URQUHART.

WILDE, J. H. K. (1949.) **Experimental use of dimidium bromide (1553) in the treatment of** *T. congolense* **infection in Zebu cattle.**—*J. comp. Path.* **59.** 48–53. **2514**

W. confirms the high trypanocidal qualities of the drug, dimidium bromide (1553), against *Trypanosoma congolense* infections in cattle. The evidence of previous observers that the drug may be closely associated with photosensitization is recorded. Three series of experiments are described in which 11 out of 121 animals had symptoms of delayed toxicity; all, except one, slowly recovered following palliative treatment.

A single dose of 1 mg. per kg. in freshly prepared 2 % solution effected a cure, and is recommended as suitable for field use.

—FERGUS P. MCCULLOUGH.

LAUNOY, L. (1949.) Précisions sur la virulence actuelle de *T. gambiense* (souche Yaoundé) pour le rat. [**The virulence of** *Trypanosoma gambiense* **in the rat.**]—*Bull. Soc. Path. exot.* **42.** 243–249. **2515**

L. found that a (Yaoundé) strain of *T. gambiense* when inoculated intraperitoneally into white rats in a dosage of 1–20 million parasites rapidly invaded the blood-stream and very soon underwent trypanolysis, although it was still infective for the mouse at a very low dosage. This early infectivity of the blood was seen in some rats even when the clinical period of incubation was abnormally prolonged. Very large doses in mice were also rapidly followed by blood invasion and, in some cases, death from septicaemia.

One case of paralysis was noted in a rat, and in discussion on the paper the occurrence of paralysis in rats inoculated with three other strains of *T. gambiense* was reported.—M. L. CLARK.

HAJDU, Š. (1949.) Príspevok k príprave a hodnoteniu trypanosomového antigénu. [**Preparation of** *Trypanosoma equiperdum* **antigen.**]—*Čas. československ. Vet.* **4.** 393–403. **2516**

H. discusses the technique for the preparation of antigenic extracts from the blood of dogs that had been injected intravenously with blood from g. pigs infected with *T. equiperdum*. The extracts were prepared from trypanosomes isolated from the dogs' blood. Alcoholic extracts were less reliable than phenolized saline extracts, the diagnostic value of which, however, decreased when stored for more than one week. There are seven tables giving details of the number of trypanosomes per unit ml. of dogs' blood, amount of antigen extracted, and titration results with various fresh and stored extracts.—E. G.

GOLDSBY, A. I. (1950.) **Giardiosis of the chinchilla.**—*Vet. Med.* **45.** 239–240. [Author's summary copied *verbatim*.] **2517**

The flagellate found associated with enteritis of chinchilla has been discussed and measurements of the same given.

FRITZSCHE, K., & GAUL, H. (1949.) Trichomonaden im Eileiter des Rindes. [**Trichomonads in the oviduct of the cow.**]—*Tierärztl. Umsch.* **4.** 385–386. **2518**

Seven living trichomonads were found in one oviduct of a cow with pyometra. The authors believe this to be the first case reported in the literature.—W. R. BETT.

McGregor, J. K. (1949.) **Observations on the prophylactic value of certain drugs for enterohepatitis infection (blackhead) in turkeys.**—*Canad. J. comp. Med.* **13.** 257–261. **2519**

Enheptin T (thiametroimidine) fed for 48 days in a concentration of 0·05 % prevented the development of enterohepatitis in 49 poults exposed to infection at the time treatment was commenced. Appetite and thirst remained normal, and weight gains were normal for 6-week-old poults. There was no evidence of enterohepatitis in 12 birds killed at the end of the experiment. Metachloridine, tetramethyl-thiuram disulphide, tetraethylthiuram disulphide, hexachlorethane, sulphaquinoxaline, compounds P-196, P-29, and bacitracin had no appreciable effect in preventing or curing enterohepatitis under the conditions of the experiment.

—R. Gwatkin.

Waletzky, E., Brandt, M. C., Bliznick, A., & Hughes, C. O. (1949.) **Some new chemotherapeutic agents in experimental enterohepatitis (blackhead) of turkeys.**—*J. Parasit.* Sect. 2. **35.** 16. Only abst. given. **2520**

Experimentally induced enterohepatitis was not cured by the continuous administration of the antimalarial or anticoccidial drugs tested. Two related compounds, "enheptin-T" and "enheptin-P", however, were highly active even when treatment began four or more days after the inoculation of the turkeys with the infective agent, details of the preparation of this agent being given.

—E. Eden.

Swales, W. E. (1950.) **Enterohepatitis (blackhead) in turkeys. V. Further experiments on chemotherapy.**—*Canad. J. comp. Med.* **14.** 118–125. **2521**

The results of 21 experiments with miscellaneous compounds are given. Those of greatest interest were obtained with 2-amino-5-nitrothiazole (enheptin-T). Poults were protected from harmful enterohepatitis even when treatment was delayed to the tenth day after ingestion of infective eggs of *Heterakis gallinae*. The drug is believed to be effective against both *Histomonas* and *Heterakis*. Embryonated eggs brought about the disease in a similar way to natural exposure. No toxic effect was noted from the use of the drug.—R. Gwatkin.

Riedel, B. B. (1945.) **The effect of ascarid infections on the susceptibility of chickens to coccidiosis.**—*Poult. Sci.* **29.** 201–203. [Author's summary copied *verbatim*.] **2522**

An investigation was undertaken to determine if chickens infected with *Ascaridia galli* were predisposed to infection by *Eimeria tenella*. Four experimental and four control groups were used. At the age of one week each of the experimental chicks was infected with 400 embryonated ascarid ova. Four weeks later all the control and all the experimental chicks were individually infected with 35,000 sporulated oocysts.

According to the weight records and morbidity, the nematode infected chicks were less resistant to coccidiosis than the controls. The mortality and numbers of caecal lesions among the experimental groups of chicks were about the same as those in the control groups.

Wilson, J. E. (1950.) **Mepacrine hydrochloride in the treatment of avian coccidiosis. [Correspondence.]**—*Nature, Lond.* **165.** 450–451. **2523**

A solution of mepacrine hydrochloride containing 2 g. per gal. was given as drinking water to chicks 72 hours after oral administration of oocysts. This treatment proved to be unsatisfactory against coccidiosis, although in some other experiments slight coccidiostatic properties were observed. In none of these cases did mepacrine compare favourably with sodium sulphamethazine.

—E. Eden.

Chebotarev, R. S. (1946.) **[Influence of worm infestation (ascarids, strongyles) on the course of piroplasmosis in horses.]**—*Veterinariya, Moscow.* **23.** No. 5–6. pp. 9–12. **2524**

Cases from various parts of the U.S.S.R. point to there being more *Babesia* infection in those regions where horses are infected with ascarids or strongyles. The percentage of deaths in worm-infested horses is also much higher. The number of ascarid and strongyle eggs was eight times greater in horses that died than in those that recovered. According to C. the reason for the greater susceptibility appears to be the allergic condition of the tissues caused by the invasion of the helminths.—F. A. A.

Pegreffi, G., & Mura, D. (1948.) Sulla piroplasmosi delle capre. **[Piroplasmosis (*B. motasi*) in goats in Sardinia.]**—*Atti Soc. ital. Sci. vet.* **2.** 72–78. [English and French Summaries; abst. from English summary.] **2525**

The authors studied an enzootic disease in a herd of goats in Sardinia. They ascertained that it is a piroplasmosis; the causal agent was identified as *Babesia motasi*. The vector was identified as *Haemaphysalis punctata*.

Splitter, E. J. (1949.) **Quinoline diphosphate in experimental anaplasmosis.**—*Vet. Med.* **44.** 418–419. **2526**

Two infected splenectomized calves were given, during the phase of infection when the percentage of infected erythrocytes was increasing, daily

intravenous injections of 7-chloro-4-(4′-diethylamino-1′-methylbutylamino) quinoline diphosphate and 6-methoxy-8-(5′-isopropylamino-pentylamine) quinoline phosphate at dose rates of 3 mg. and 3·5 mg. per kg. body-weight respectively, one half dose being given every 12 hours for 6 and 4 days respectively.

In neither case was the development of the infection affected.—L. P. Joyner.

Foote, L. E., Farley, H., Pearson, C. C., & Kliewer, I. O. (1949.) **Intravenous use of ethyl alcohol and various drugs in treatment of acute anaplasmosis. A preliminary report.**—*N. Amer. Vet.* **30.** 497–503. **2527**

The authors briefly discuss the literature on the pathology of the disease in cattle. Anaplasma bodies spontaneously diminish in numbers 2–3 days before anaemia reaches a maximum in treated and untreated cases and frequently in fatal cases. Recovered animals remain carriers for considerable periods and it is reported that one case lost the "carrier state" after 12 years but remained immune although no protective antibodies could be demonstrated in the blood. Relapses in recovered cases may be initiated by splenectomy.

In fatal cases, despite improvement in the blood picture, atony of the rumen and constipation precipitate death. These symptoms have been found to respond to treatment with ethyl alcohol and sodium chloride and distilled water. Approximately 50 ml. ethyl alcohol per 300 lb. body-weight were administered intravenously. Mercurochrome, ferrous sulphate, ferric chloride, or copper sulphate are reported as useful adjuncts. Eight case-histories and electron micrographs of erythrocytes containing anaplasma bodies are given.—L. P. Joyner.

Weinman, D., & Klatchko, H. J. (1950.) **Description of toxin in toxoplasmosis.**—*Yale J. Biol. Med.* **22.** 323–326. [Authors' conclusions copied *verbatim.*] **2528**

A toxin is produced in animals infected with *Toxoplasma.* It has provisionally been named toxotoxin, cognizance being taken that it may prove to have more than one component. The toxin develops *in vivo* and can be obtained several days before and up to death. It is produced in the peritoneal fluid of infected animals and is lethal to mice by the intravenous route. Notable characteristics of toxotoxin are its extreme rapidity of action and its heat stability. All data thus far obtained suggest that it is not an endotoxin. It is probably a protein or else contains a protein fraction without which activity is lost. Toxicity is not associated with a substance of low molecular weight.

See also absts. **2665** (effect of suramin on trypanosomes); **2736** (simultaneous complement-fixation test for dourine and glanders); **2737** (mounting technique for protozoa); **2738** (staining of protozoan parasites); **2742** (report, Brit. Guiana).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

Stanley, W. M. (1948.) **The nature of viruses.**—*Proc. 4th Internat. Congr. Trop. Med. Malar.* pp. 385–390. **2529**

A general review, illustrated by a useful table giving approximate sizes of viruses and reference materials. Information concerning the mode of reproduction of viruses is urgently needed.
—W. R. Bett.

Bergold, G. H. (1950.) **The multiplication of insect viruses as organisms.**—*Canad. J. Res. Sect. E.* **28.** 5–11. [Author's abst. copied *verbatim.*] **2530**

Electron micrographs of purified preparations of four different insect viruses indicate the presence of morphologically different forms, which are probably stages of multiplication. The virus first appears as a minute spherical body. This body increases in size and the virus appears as an elongated, curved body, surrounded by a membrane. Later the virus particle straightens out, ruptures the membrane, and appears as a rod-shaped particle characteristic of insect viruses. One may assume that the rod-shaped virus particle contains several smaller subunits each of which develops into a rod. The complicated nature of multiplication indicates that insect viruses are organisms with a relatively simple morphological structure of the mature rod.

Romagnoli, A. (1948.) Le inclusioni cellulari nelle malattie da ultra-virus degli animali domestici. [**Cell inclusions in virus disease of domestic animals.**]—*Nuova Vet.* **24.** 3–7; 54–59 & 88–94. **2531**

R. illustrates the morphology, the methods of detection, and the diagnostic importance of the cell inclusions in virus diseases of domestic animals. He discusses neurotropic cell inclusions (Negri bodies, Joest and Degen bodies, Kleine bodies, Lentz bodies); epitheliotropic cell inclusions (Guarnieri bodies, Bosc bodies, Rivolta and Bollinger bodies, Bendinger bodies, Seifried bodies, Olitskj bodies, Kuhn bodies); and lastly the cell inclusions of which the classification is doubtful (Levinthal, Coles, and Lillie bodies, cell inclusions of swine fever and of Aujeszky's disease).
—B. Baldelli.

Angulo, J. J. (1949.) **Demonstration of viral inclusion bodies in unstained tissue sections with the aid of the phase micro-**

scope. The inclusion bodies of rabies, vaccinia, wheat mosaic, yellow bean mosaic, ectromelia, meningopneumonitis, feline pneumonitis, mouse pneumonitis, feline panleukopenia, and trachoma.—*Arch. ges. Virusforsch.* **4.** 118–129. [In English. Author's summary copied *verbatim.*] **2532**

With the aid of the phase microscope, the inclusion bodies of rabies, vaccinia, wheat mosaic, yellow bean mosaic, ectromelia, meningopneumonitis, feline pneumonitis, mouse pneumonitis, and feline panleukopenia were easily examined in unstained tissue sections. Besides, the inclusion body of trachoma was studied in smears. Possible applications of the phase microscope in virology are proposed.

SMITHBURN, K. C. (1948.) **Neurotropic viruses in Central Africa.**—*Proc. 4th internat. Congr. Trop. Med. Malar.* pp. 576–586. **2533**

The following five hitherto unknown viruses are described: Bwamba fever virus, one of the largest of the neurotropic viruses; West Nile virus; Semliki Forest virus; Bunyamwera virus; and Mengo encephalomyelitis virus. Immunity to each has been found in man.—W. R. BETT.

GRUNNET, N. T. (1950.) Forsøg over en eventuel udskillelse af mund- og klovesygevirus med tyresæd fra henholdsvis angrebne eller vaccinerede dyr. [**Possibility that the virus of F. & M. disease might be present in the semen of diseased or vaccinated bulls.**]—*Maanedsskr. Dyrlaeger.* **61.** 167–171. [English and French summaries; abst. from English summary.] **2534**

Six bulls were investigated concerning the excretion of virus in the semen during the course of infection with F. & M. disease. Excretion of virus was confirmed in three of the bulls by intracutaneous inoculation of the semen in g. pigs.

The semen from ten bulls was examined following their vaccination with the official F. & M. disease vaccine; in no instance was virus demonstrated by the daily exposure of susceptible heifers by placing tampons dipped in semen on the surface of their tongues.

P.M. examination of the genital organs of F. & M. disease infected and of vaccinated bulls revealed no lesions.

Apart from a brief and slight change in the motility of the spermatozoa during the period of generalization, no essential change in motility and concentration was demonstrated during the course of the disease.

BROOKSBY, J. B. (1949.) **Differential diagnosis of vesicular stomatitis and foot-and-mouth disease. Examination of virus samples from Mexico with special reference to complement fixation.**—*J. Hyg., Camb.* **47.** 384–389. [Author's summary copied *verbatim.*] **2535**

The usefulness of the complement-fixation test in differential diagnosis between vesicular stomatitis and foot-and-mouth disease has been demonstrated on two "field" specimens of virus from Mexico. Examples are given of the practical applications of the other methods for this differential diagnosis.

MICHELSEN, E. (1950.) **Theoretical interpretations of some experiments with intermediate variants of foot-and-mouth disease virus.**—*Acta path. microbiol. scand.* **27.** 79–85. [In English. Author's summary slightly modified.] **2536**

Theoretical considerations on the structure of "intermediate variants" on the basis of inoculation results obtained in practice with such a variant on immune cows have afforded the basis for the following conception.

The complex virus gives rise to the formation of a complex antibody. Besides reacting with this complex antibody, the virus will be able to react also with other antibodies after simple quantitative laws: Thus for instance, a C^{OA} virus will not only react with C^{OA} antibody but, because of the dominating C mass of the C^{OA} virus, it may also react with C antibody. C^{OA} antibody will be able to react not only with C^{OA} virus but also with C, O, and A viruses as it possesses a surplus of antibody characters, and in the reaction with these viruses it will respond to a larger C, O, or A mass, respectively.

If immune organisms are inoculated with a virus as, for instance, the aforementioned C^{OA}, phenomena of interference will frequently come up. After inoculation with C^{OA} virus, non-immune animals will become COA-immune, whereas, for instance, C-immune cows will merely remain C-immune, as the C antibody present in the organism neutralizes the entire C^{OA} complex, thus giving rise merely to continuous C-immunity.

HERZOG, E. (1948.) El diagnóstico histológico más seguro de la rabia. [**More accurate histological diagnosis of rabies.**]—*Bol. mens. Direcc. Ganad., Montevideo.* **30.** 170–180. **2537**

H. calls attention to some histological changes in human and animal rabies, which were first noted in 1900, and which have been largely neglected since the discovery of Negri bodies. He refers to the inflammatory and degenerative changes found in the plexiform ganglion of the vagus and the superior cervical ganglion of the sympathetic, which lie side by side in the neck about the level of the bifurcation of the carotid. In cases of rabies

there are foci of degenerated nerve cells with chromatolysis and degenerative changes in the nucleus with or without intense neuronophagia in the capsular cells, and also focal or diffuse inflammation in the stroma of the ganglion. These lesions are said to be secondary to those of the central nervous system, but there is no quantitative relationship between the number of Negri bodies and the extent of the vagal and sympathetic changes.

The routine for diagnosis is as follows: (1) Examination of frozen sections of both ganglia stained by cresyl violet. (2) Examination of sections of Ammon's horn for Negri bodies. (3) In cases negative histologically, inoculation of Ammon's horn into experimental animals. (4) In doubtful cases, frozen sections of the corpora nigra and of the medulla are searched for signs of encephalitis. Rabies is considered to be present where there are Negri bodies, or where the abovementioned ganglionic lesions are present. Animals with encephalitis must be treated with suspicion, although they may have had only distemper.

—I. W. Jennings.

Bailly, J. (1950.) Contrôle de la vaccination antirabique des animaux. [**Anti-rabies vaccination of animals.**]—*Bull Off. internat. Epiz.* **33.** 152–167. **2538**

Numerous different methods of vaccine production are enumerated with special reference to those of practical value in the field. The most practicable to date appears to be a phenolized vaccine. Webster's views on vaccine in the U.S.A. are criticized. It is emphasized that the innocuity of a vaccine must be judged on a series of animals. The Swiss white mouse is not the animal of choice. Similarly the efficacy of a vaccine must be judged in groups of animals selected at random.

—G. V. Laugier.

Kalusch, A. (1949.) Die Wutschutzimpfung bei Hunden [**Antirabic inoculation in dogs.**]—*Wien. tierärztl. Mschr.* **36.** 244–247. **2539**

In heavily infected states compulsory inoculation of all dogs is advised; in less heavily infected states, of all dogs within an area of 50–100 km. of the infected area.—W. R. Bett.

Burkhart, R. L., Jervis, G. A., & Koprowski, H. (1950.) **Postvaccinal paralysis and demyelination in the dog following antirabies vaccination.**—*Vet. Med.* **45.** 31–35. **2540**

It is shown that neuroparalytic accidents may result from the use of phenol-inactivated tissue vaccines in dogs as in human beings. Six such cases are reported, four occurring in a group of 90 dogs and two in a group of 60 dogs. Symptoms appeared 14–20 days after vaccination. P.M. lesions are described and comprised a multiple disseminated encephalomyelitis of the demyelinating type. No infective agent could be isolated.

—G. V. Laugier.

Ten Broeck, C. (1950.) **A test for the antigenicity of rabies vaccine.**—*Proc. Soc. exp. Biol., N.Y.* **73.** 297–301. [Author's conclusion copied *verbatim.*] **2541**

A simple test for evaluating the antigenicity of rabies vaccine is described and its advantages and disadvantages are discussed.

Saco, T. R., & Caparó, A. C. (1949.) Difteroviruela aviar en el *Phalacrocoraz bouganville* o guanay. [**Fowl pox in cormorants** *Phalacrocorax bouganville* **in Peru.**]—*Rev. Fac. Med. vet. Lima.* **4.** 19–21. [English summary.] **2542**

The "Guanays" [cormorants] are wild birds living on islands along the Peruvian coast, and their excrement is widely used as an agricultural fertilizer. "Guanay pox" has been identified in these birds from macroscopic lesions similar to those of fowl pox, but a virus was not recovered and no experimental inoculations were attempted.

—J. O. L. King.

Collier, W. A., & van Thiel, W. J. (1949.) De hemming der pokkenhaemagglutinatie na revaccinatie. [**The inhibition of vaccinia haemagglutination after revaccination.**]—*Ned. milit.-geneesk. Tijdschr.* **2.** 97–110. [Abst. in *Bull. Hyg., Lond.* **25.** 78. (1950), copied *verbatim.* Signed: E. T. C. Spooner.] **2543**

Neither the skin reaction nor humoral antibody titre after re-vaccination have been proved to indicate the state of immunity against smallpox.

As variola and vaccinia are general infections, humoral immunity is probably the more important indicator. Different antibodies are responsible for inhibition of virus haemagglutination and for virus neutralization, but the two may develop in parallel.

Skin immunity and humoral immunity are independent of one another, although they may often correspond in degree. Many cases of variola have been described in persons whose skin reactions have indicated immunity.

In the experiments reported in this paper, the authors compared skin reactions and haemagglutination inhibition titres of 99 re-vaccinated subjects. Blood samples were taken on re-vaccination with glycerinated lymph of proved activity, and again 20 and 30 days later. Sera were inactivated, and serial dilutions were mixed with two haemagglutinating doses of vaccinia virus from the buffalo (*karbouw*): 0·5 per cent. washed fowl red cells were added after an hour's incubation at

37° C. Tests were read after one and two hours at room temperature. The results of these haemagglutination inhibition tests are tabulated. They show that many previously vaccinated subjects possessed no haemagglutinin inhibiting antibody, in spite of having been vaccinated not longer than two years previously; that two subjects failed to produce any inhibitory titre; and that most showed a rise in titre 20 or 30 days after re-vaccination. As often found with other infections, there was a tendency for those with a low initial titre to show the best antibody response, high initial titres often remaining unchanged at the later bleedings; but this observation was not constant.

Skin reactions on re-vaccination were noted. The tables show that the nature of the skin reaction (classified as negative, immediate, accelerated and primary) was quite independent of haemagglutinin inhibition titre.

Bell, F. R., & Dudgeon, J. A. (1948.) **An epizootic of influenza in a ferret colony.**—*J. comp. Path.* **58.** 167–171. **2544**

Records of influenza epizootics among ferrets in the natural state are rare, only one having been previously described. The authors report an outbreak of influenza in two ferret colonies at a Veterinary Research Station in Sussex, during February 1947—a time when there were many localized outbreaks of human influenza. Indirect evidence suggests that the outbreak was caused by influenza virus A.—W. R. Bett.

Lanni, Y. T., Lanni, F., & Beard, D. (1950.) **Dialyzable factor in allantoic fluid affecting virus hemagglutination-inhibition reactions.**—*Proc. Soc. exp. Biol., N.Y.* **73.** 229–235. [Author's summary copied *verbatim.*] **2545**

The difference between purified and unpurified swine influenza virus with respect to development of inhibitor sensitivity on heating is ascribed to a factor, identified as calcium, occurring in normal and virus-infected allantoic fluids. The factor, which is lost, or considerably diminished, during purification, may be removed also by dialysis or neutralized by citrate and oxalate. Calcium, in low concentration, depresses the development of inhibitor sensitivity by swine influenza virus on heating; magnesium is ineffective. In contrast with the swine virus, influenza virus A (PR8 strain) is relatively insensitive to calcium. This difference between two viruses suggests a possible explanation for the generally observed variation among influenza viruses with respect to development of inhibitor sensitivity on heating.

Pérez, J. E., Baralt-Pérez, J., & Klein, M. (1949.) **The reversal *in vivo* by BAL of $HgCl_2$-inactivated influenza A virus in the chick embryo.**—*J. Immunol.* **62.** 405–413. **2546**

Influenza A virus PR8 was inactivated by a 1:20,000 solution of $HgCl_2$ after contact for 30 min. at 28° C. It remained non-infective for mice and chick embryos upon dilution in allantoic fluid.

The injection *via* the allantoic route of a 1:400 solution of aqueous B.A.L. from five hours before to two hours after injection of the virus restored its activity.

There is indirect evidence that the inactive complex is adsorbed on the cells of the allantoic sac. Free virus was, however, demonstrated in the allantoic cavity, and it is not known whether the action of B.A.L. was confined to this.

—Nesta Dean.

Tamm, I., & Fluke, D. J. (1950.) **The effect of monochromatic ultraviolet radiation on the infectivity and hemagglutinating ability of the influenza virus type A strain PR-8.**—*J. Bact.* **59.** 449–461. [Author's summary copied *verbatim.*] **2547**

The infectivity of influenza virus type A, strain PR-8, is more sensitive to monochromatic ultraviolet at 2,652 A than at 2,803 A; the sensitivity of the hemagglutinating ability of the same virus, though several hundred times less over-all, is greater at 2,803 A than at 2,652 A.

I. Bawell, M. B., Deuel, R. E., Jr., Matumoto, M., & Sabin, A. B. (1950.) **Status and significance of inapparent infection with virus of Japanese B encephalitis in Japan in 1946.**—*Amer. J. Hyg.* **51.** 1–12. [Author's summary and conclusions copied *verbatim.*] **2548**

II. Deuel, R. E., Jr., Bawell, M. B., Matumoto, M., & Sabin, A. B. (1950.) **Status and significance of inapparent infection with virus of Japanese B encephalitis in Korea and Okinawa in 1946.**—*Ibid.* 13–20. [Author's summary and conclusions copied *verbatim.*] **2549**

III. Sasa, M., & Sabin, A. B. (1950.) **Ecological studies on the mosquitoes of Okayama in relation to the epidemiology of Japanese B encephalitis.**—*Ibid.* 21–35. [Author's summary copied *verbatim.*] **2550**

IV. Sabin, A. B. (1950.) **Search for virus of Japanese B encephalitis in various arthropods collected in Japan in 1946–1947.**—*Ibid.* 36–62. [Author's summary copied *verbatim*, and appendix slightly modified.] **2551**

I. The status of inapparent infection among human beings of different ages and different types of domestic animals was determined in different parts of Japan during the months of October and November, 1946, approximately 7 years after the

last significant epidemic of encephalitis. This was done by testing the sera of 975 people, 102 horses, 75 cows, 50 pigs, 36 goats and 38 chickens for neutralizing antibodies against the virus of Japanese B encephalitis.

The results indicated that the status of inapparent infection was markedly different in Sapporo and Kumamoto, both areas in which very little encephalitis had been recorded. Tokyo and Okayama, where a number of epidemics had occurred in previous years, presented an essentially similar pattern.

The incidence of antibodies among human beings of all ages in Sapporo and vicinity was so low (less than 5 per cent in 233 people) that there may be reasonable doubt with regard to the dissemination of this virus among human beings in this region. In Kumamoto, the incidence of antibodies for the virus among human beings increased progressively with age, reaching a maximum of 78 per cent among those 60 years of age or older.

The results obtained in Tokyo and Okayama suggest that inapparent infection among human beings is negligible or absent during interepidemic years.

Among the domestic animals, none of the chickens had antibody, thus confirming previous observations that the virus is not being disseminated among them, and indicating that the effective vector either does not reach chickens, or bites them only rarely.

Horses, cows, pigs and goats all showed evidence of acquiring antibody at a time when the virus was being disseminated little or not at all among human beings.

No significant difference was found between the incidence of inapparent infection among human beings in rural and urban areas, suggesting that proximity to larger numbers of domestic animals was not a determining factor.

The high incidence of antibodies in certain age groups suggests that in future outbreaks a truer picture of age-specific attack rates for encephalitis may be obtained by basing the calculations on the proportion of individuals without antibody.

II. The status of inapparent infection with the virus of Japanese B encephalitis as determined by the presence of neutralizing antibody in the serum was investigated in human beings of different ages and domestic animals in Korea and Okinawa. In Korea, tests were made on the sera of 425 people, 29 horses, 37 cows, 26 pigs and 23 chickens. Surveys were carried out in Seoul, the capital city, and its vicinity, as well as in Kunsan, a city 100 miles south of Seoul. The regions of Nago and Taira were investigated on Okinawa, and sera from 232 people, 20 horses, 11 cows, 11 pigs, 20 goats and 8 chickens were included in the tests.

In Korea, the results of tests on human beings indicated that approximately 90 to 100 per cent of all people are eventually infected with the virus of Japanese B encephalitis despite the fact that clinically recognized cases of encephalitis among Koreans are so rare as to be almost negligible.

The tests on Korean children under 4 years of age in a region in which a small outbreak of encephalitis was observed among American soldiers indicated that the young Korean children suffer inapparent infections during the period when the virus is being disseminated among human beings. A similar high incidence of antibodies among young children was found on Okinawa, 16 months after the epidemic of 1945, which affected a large number of the native population.

Inapparent infection of the domestic animals, including horses, cows, pigs, and goats was much higher in Korea and Okinawa than in Japan. Particularly noteworthy was the fact that 100 per cent. of the pigs tested in these two regions had antibodies for the virus during their first year of life.

The complete absence of antibodies among the chickens tested both in Korea and Okinawa again suggested that the effective vector in the transmission of this virus either does not feed on chickens, or only very rarely.

Various circumstances suggest that the absence of outbreaks of Japanese B encephalitis among the Korean population might be related to some peculiarity of the host rather than to factors concerned with the dissemination or dosage of the virus.

III. The incidence, androphilism, zoophilism, and other aspects of the ecology of various species of mosquitoes were studied in the Okayama Prefecture between July 7th and September 7th, 1946.

Among the 18,324 adults collected in Okayama City in human dwellings and animal shelters, and by traps baited with human beings or various animals, approximately 81 per cent. were *Culex tritaeniorhynchus*, 10 per cent. *Culex pipiens* var. *pallens*, and 6 per cent. *Anopheles hyrcanus sinensis*.

In mountain districts, in which Japanese B encephalitis is known to occur, almost no *C. pipiens* were found and *Culex vishnui* took the place of *C. tritaeniorhynchus*. *Mansonia uniformis*, an aggressive biter of human beings, was encountered only in the coastal Kojima Bay area, where it constituted 20 per cent. of the total number.

C. pipiens was found to feed predominantly on chickens, next on human beings, and in only negligible numbers on the mammalian domestic animals. The fact that chickens, which are susceptible, have regularly failed to show evidence of

infection suggests that *C. pipiens* does not function as a vector under natural conditions.

C. tritaeniorhynchus was the chief mosquito attracted by the mammalian domestic animals and human beings. However, few of them were found engorged with blood after biting human beings, while nearly all of them usually became engorged in the mammalian animal traps and shelters.

C. tritaeniorhynchus and *A. hyrcanus sinensis* were found during the day resting in the dark and humid corners of the animal shelters in which they became engorged with blood the previous night. This observation suggests that the chain of transmission from the mammalian domestic animals, which are more regularly infected with the virus, to human beings might be broken by means of antimosquito measures directed at killing the engorged mosquitoes in the animal shelters.

IV. A total of 245 separate lots of arthropods collected in Japan in 1946 and 1947, including thousands of adult mosquitoes and mosquito larvae of different species, as well as hundreds of ticks, blood-sucking lice and chicken mites, yielded negative results in tests for the presence of virus. These anthropods were collected, for the most part, in the same area of Japan where the bulk of previous Japanese investigations had been performed.

During one stage of the present investigation, many isolations of Japanese B encephalitis virus were obtained in serial passage tests with material from mosquito larvae and adults, ticks, and blood-sucking lice, but, with a few inexplicable exceptions, these could be accounted for by the poor technique of inadequately trained laboratory assistants.

Although the virus is known to be disseminated yearly among domestic animals and irregularly among human beings, it is noteworthy that in 1946 there was no outbreak of the disease among human beings, while in 1947 a small outbreak of Japanese B encephalitis had occurred in human beings and horses in the areas where the mosquitoes and arthropods were being collected.

Circumstantial evidence that mosquitoes are the vectors responsible for epidemics and epizootics of the disease, although not necessarily for the perpetuation of the virus in nature from year to year and over the winter, is so strong that the present data do not indicate that the mosquitoes which were investigated may not be infected under natural conditions. They do suggest, however, that the infection rate probably is not very high (perhaps less than 1 in 100 to 1 in 1,000 mosquitoes), even during periods when small outbreaks of the disease are in evidence among human beings and horses.

Studies on the incidence of inapparent infection and the ecology of mosquitoes in the affected regions suggest that *Culex tritaeniorhynchus* and *Anopheles hyrcanus sinensis* are the chief mosquitoes requiring consideration as vectors of the virus.

There is suggestive evidence that the virus may be perpetuated in mammalian domestic animals by a primary infection chain, which does not depend on mosquitoes. Although completely negative results were obtained in the present experiments with ticks and blood-sucking lice of these animals, further work along these lines is indicated, although the possibility exists that the primary infection chain responsible for the perpetuation of the virus in nature may not depend on an arthropod vector.

[Since this paper has been submitted for publication, Hammon *et al.* have reported observations which have an important bearing on this problem. The negative results obtained with large numbers of various species of mosquitoes (including *C. tritaeniorhynchus*, *C. pipiens*, *and An. hyrcanus sinensis*) collected in Okinawa towards the end of a severe outbreak in 1947 and in Japan in 1947 when both human and equine cases occurred, as well as the negative results with *An. hyrcanus sinensis* and *C. pipiens* collected in Okayama in 1948, are as important as the positive results with several lots of *C. tritaeniorhynchus* collected in Okayama early in August, 1948, shortly before the appearance of a moderate outbreak of the disease. These observations of Hammon *et al.* as well as those of S. indicate that the infection among the mosquito vectors is limited not only in time but also in incidence. The very low infection rate among the mosquito vectors, even at the end of an outbreak, suggests how improbable it is that perpetuation of the virus in nature through the winter and from year to year during interepidemic and interepizootic periods could be achieved by the very small numbers of hibernating mosquitoes.]

CHADDOCK, T. T., & CARLSON, W. E. (1950.) **Fox encephalitis (infectious canine hepatitis) in the dog.**—*N. Amer. Vet.* **31.** 35–41.

2552

This is a general article on the disease. A number of different species have been found to be susceptible to the virus, but a safe vaccine has not yet been developed. A diagnostic test is described involving the inoculation of suspected material into the anterior chamber of the eye of a young dog or fox. In three days the cornea becomes cloudy and the inclusion bodies of fox encephalitis can be demonstrated in smears, thus enabling a speedy differentiation between this disease and canine distemper.

VASILIEV, A. V. (1947.) **[The role of ticks in equine encephalomyelitis in the southern**

Ural region.]—*Veterinariya, Moscow.* **24.** No. 7. pp. 5–9. **2553**

Suspensions made from ticks, *Dermacentor marginatus*, collected from naturally infected horses and injected subcutaneously into g. pigs and rabbits caused death in most cases; when subsequent passages were made the virulence of the virus increased. Infection was also set up by rubbing such suspensions into scarified skin. Suspensions made from ticks taken from healthy horses gave negative reactions.

The conclusion reached is that horses may be infected by rubbing squashed ticks into lesions of the skin. The author speculates whether ticks are merely carriers or whether the observed ten-year cycles in outbreaks of equine encephalomyelitis are a consequence of a life cycle of the virus in a chain of various hosts, such as mosquitoes, flies, and rodents.—F. A. A.

Iriminoiu, G. (1948.) Méningo-encéphalomyélite enzootique du cheval en Roumanie. [**Enzootic equine meningo-encephalitis in Roumania.**]—*Bull. Off. internat. Epiz.* **29.** 293–298. **2554**

Equine meningo-encephalitis was imported into Roumania from Germany after the first world war. The virus is identical with the German type, though it is difficult to isolate since it may be localized in certain areas only of the nervous system and also disappears shortly before or after the death of the animal.—W. R. Bett.

Andreev, K. P. (1947.) [**Epidemiology of equine infectious anaemia.**]—*Veterinariya, Moscow.* **24.** No. 2. pp. 7–11. **2555**

A discussion on the four known phases (acute, subacute, chronic, and latent) of this disease. The acute form may be a periodic peak of an otherwise endemic condition; this appears to be particularly so in low-lying localities or where hygienic conditions are poor. An outbreak may also occur through some shock factor, such as summer heat, overwork, bad fodder, or piroplasmosis. In these cases the disease was in its latent form but may have escaped previous attention because the mild clinical symptoms, if any, can be mistaken for those of other diseases. Carriers need not necessarily infect other horses as the infectivity of the virus apparently varies very considerably.—F. A. A.

Polson, A. (1947.) **The diffusion constant and molecular weight and shape of neurotropic horsesickness virus.**—*Onderstepoort J. vet. Sci.* **22.** 41–50. **2556**

Diffusion of the virus particles from a suspension of mouse brain in 20 % normal horse serum into 10 % normal horse serum was studied by infectivity tests of the original suspension and the dispersion medium after diffusion had progressed for 2–4 days. The metal apparatus employed enabled four diffusion columns to be tested in a single experiment. From the results of six experiments a diffusion constant of $0{\cdot}87 \times 100^{-7}$ sq. cm. per sec. was calculated. Combining this finding with other known physical properties of the virus it was concluded that the particles were essentially spherical in shape, with a diameter of 48·8 mμ and a molecular weight about 41,000,000.

—H. H. Skinner.

Alton, G. G. (1950.) Expériences sur l'emploi du vaccin de lapin contre la peste bovine, à Hong-Kong, en 1949. [**Use of rabbit-passaged rinderpest virus in Hong Kong.**]—*Bull. Off. internat. Epiz.* **33.** 202–203. **2557**

Nine thousand indigenous cattle were vaccinated with rabbit-passaged virus with complete success. European cattle which had been vaccinated with formolized tissue vaccine eight months earlier usually had a rise in temperature 3–4 days after vaccination with rabbit-passaged virus. Four-month-old calves had symptoms of diarrhoea and there was one death.—G. V. Laugier.

Blazhevich, I. V. (1947.) [**Sheep as carriers of bovine malignant catarrh.**]—*Veterinariya, Moscow.* **24.** No. 2. pp. 20–22. **2558**

Investigations were made by B. in 18 places where bovine malignant catarrh was present. In all cases cattle were pastured or stabled with sheep. But in a few of these villages some of the cattle were kept segregated from sheep and remained free from the disease; infected cattle recovered when they were segregated from sheep and they did not infect disease-free herds when placed in contact with them.—F. A. A.

Barcz, S. (1949.) Złośliwa gorączka kataralna bydła (głowica). [**A malignant form of catarrhal fever in cattle.**]—*Med. weteryn.* **5.** 629–631. [Abst. from English summary.] **2559**

A description of the treatment of two cases of catarrhal fever in cattle, that were of a malignant form. The disease responded well to intravenous injections of cejodol [cejodyl? an iodine preparation?—Ed. *V.B.*] in one case and in the second to intramuscular injections of milk and chinotropin [a quinoline preparation?—Ed. *V.B.*] alternately.

van den Ende, M., & Turner, G. S. (1950.) **Further observations on a filtrable agent isolated from bovine lumpy skin disease.**—*J. gen. Microbiol.* **4.** 225–234. [Authors' summary copied *verbatim.*] **2560**

The method of estimating potency of lethal substances by determining death times was applied to the titration of the virus isolated from a case of

bovine Lumpy Skin Disease. It was more reliable than that based on the occurrence of recognizable lesions in the embryo after amniotic inoculation. The method was used to demonstrate the growth of virus in tissues other than skin epithelium, to determine the susceptibility of the virus to destruction by heat, and for the demonstration of neutralizing antibody. Neutralizing antibody was found in convalescent bovine sera. Normal sera from a variety of animal species including bovines feebly neutralized the virus. This feeble neutralization may indicate the presence in sera of virus-inhibiting substances other than antibody or, in the case of bovines, antibody acquired as a result of inapparent infection.

MARRONE, P. (1948.) Osservazioni sull' ectima contagioso delle capre. [**Contagious ecthyma in goats.**]—*Nuova Vet.* **24.** 376–380. **2561**

M. describes an outbreak of contagious ecthyma in which about 60 goats were affected. Many sheep housed in the same pens with the goats remained healthy. M. suggests that the two species may have a different susceptibility and adaptation to the virus. He failed to infect dogs experimentally, but was able to set up the disease in rabbits.—B. BALDELLI.

GRECO, I. (1948.) La flora batterica nella peste suina in Lombardia. [**Bacterial flora in swine fever in Lombardy.**]—*Clin. vet., Milano.* **71.** 352–353. **2562**

Of 347 pigs that had died of swine fever in Lombardy, *Salmonella* species were isolated from 20 %; *Bact. coli* from 36·5 %; *Pasteurella suiseptica* from 1·7 %; *Erysipelothrix rhusiopathiae* from 0·5 %; *Clostridium septicum* from 0·5 %; *Bacillus equirulis* associated with *Salmonella* from 0·2 %.
—B. BALDELLI.

DONATIEN, A. (1949.) Les résultats de l'étude de la peste porcine en Algérie. [**Swine fever in Algeria.**]—*Arch. Inst. Pasteur Algér.* **27.** 317–321. **2563**

A short history of the development of serum production in Algeria is given. During the war it became necessary to hyperimmunize pigs as soon as immunity was established and the quantity of virulent blood used was reduced by more than half. Two litres of serum per pig were obtained and found to be as effective as normally prepared serum. Smaller doses were found to be equally effective. Virulence tests for various strains gave no variation but antigenic properties varied. An effective method of diagnosis by intradermal test is described: 0·5 ml. of blood from suspected cases is injected intradermally into immune or hyperimmune pigs of known reaction index. Results are said to be very reliable.—G. V. LAUGIER.

YOUNG, G. A., JR., & UNDERDAHL, N. R. (1950.) **Swine influenza as a possible factor in suckling pig mortalities. IV. Relationship of passive swine influenzal immunity in suckling pigs to rate of weight gain.**—*Cornell Vet.* **40.** 201–205. [Authors' summary copied *verbatim.*] **2564**

The relationship of the seral hemagglutinin inhibitor for swine influenza virus in suckling swine to rate of gain has been studied in a sizable population of swine. The rate of gain was shown to be related to the degree of resistance to swine influenza that was transferred to the pigs by the dam through her milk.

LARRAT, R. (1948.) Traitement de la grippe du porcelet par les injections intramusculaires de novarsénobenzol. [**Novarsenobenzol (neoarsphenamine) injections given intramuscularly in the treatment of piglet influenza.**] *Rev. Élev. Méd. vét. Pays trop.* **2.** 238–239. **2565**

Eight piglets aged 2–3 months were given 300 mg. neoarsphenamine intramuscularly. All recovered, six of them within 24 hours.—NESTA DEAN.

MANNINGER, R. (1949.) Zur Geschichte der Geflügelpest. [**The history of fowl plague.**]—*Acta vet. hung.* **1.** 98–100. [In German.] **2566**

M., well known for his opinion that fowl plague and Newcastle disease are essentially identical entities, here argues that the main differences between them, notably the upper respiratory lesions in Newcastle disease and the lack of them in fowl plague, are due to the fact that the latter has been much studied under experimental conditions, in the course of which studies the virus has increased in potency, so that fowls infected with it die from the peracute effects before the development of local lesions.

Attention is drawn to a disease of fowls observed near Budapest by Petényi in 1833, the clinical syndrome of which resembled what we now call Newcastle disease.—J. E.

LEVINE, P. P., & FABRICANT, J. (1950.) **Susceptibility to Newcastle infection of chicks with congenital serum antibodies.**—*Cornell Vet.* **40.** 213–225. [Authors' summary slightly amended.] **2567**

Pedigree-hatched chicks produced by a flock previously vaccinated with Newcastle live-virus vaccine and a flock that had recovered from a natural outbreak of Newcastle disease were studied. Serum-neutralization (SN) and hemagglutination-inhibition (HI) titers were determined for the dams and for their progeny at different ages up to 24 days. On hatching, the chicks had SN titers practically

identical with those of their dams. HI titers and SN titers in the chicks were high at hatching-time but dropped to an insignificant level by the end of the second week.

Ten per cent of the vaccinated hens were negative to the HI and SN tests. None of the hens that had recovered from the natural disease had negative titers. There was a correlation between the SN and HI titers in the chicks and a similar correlation in the hens. All the chicks, whether they had high titers or not, succumbed to respiratory infection when challenged with Newcastle virus dropped on the nares. This infection was followed by a sharp rise in the HI and SN titers.

It is concluded that, in chicks, serum antibodies acquired congenitally do not protect against respiratory infection induced by the exposure of the respiratory tract to Newcastle disease virus.

SCHMITTLE, S. C. (1950.) **Studies on Newcastle disease. V. A comparison of Newcastle disease antibody titers in blood and egg yolk as measured by the hemagglutination-inhibition test.**—*Amer. J. vet. Res.* **11.** 226–230. [Author's summary copied *verbatim.*] **2568**

An improved technique is described for extracting lipids from egg yolk so that the hemagglutination-inhibition (HI) test for Newcastle disease can be carried out on eggs. The yolk is mixed with ethylene dichloride and ether, and the mixture allowed to stand for four hours at 50° C. and then for eight hours to overnight at 4° C.

A comparison was made of egg-yolk and serum-*beta* HI titers of 49 hens with no history of Newcastle disease and of 136 hens which had been either naturally or experimentally infected with *Tortor furens* (Newcastle disease virus). Both the serums and yolks of the hens which had not had the disease were negative to the HI test. The serums and egg yolks of 96·3 per cent of the exposed hens were both positive; those of 1·4 per cent were both negative. In 2·3 per cent, the serum was positive and the yolk negative. In 54·4 per cent of the hens, the serum and egg-yolk titers were the same; in 37·5 per cent, the serum titer was higher than the yolk titer; in 4·4 per cent, the yolk titer was higher.

Contamination of the yolk with albumen caused nonspecific hemagglutination inhibition.

MANTOVANI, G. (1949.) Comportamento del virus simil-pestoso nell' organismo dei polli vaccinati. **[Behaviour of the virus of Newcastle disease in vaccinated fowls.]**—*G. Batt. Immun.* **41.** 15–38. [English, French, and German summaries.] **2569**

M. reported symptoms of Newcastle disease in vaccinated fowls subsequently infected intravenously and recorded the temperature reactions in fowls experimentally infected with virus grown on chick embryos, and the behaviour and dispersion of the virus in fowls vaccinated one or more times before infection.—B. BALDELLI.

GROUPÉ, V., WINN, J. D., & JUNGHERR, E. (1948.) **Isolation of an agent in chicken embryo causing infectious sinusitis of turkeys.**—*Proc. Soc. exp. Biol., N.Y.* **67.** 397–398. **2570**

Infectious sinusitis was transmitted artificially by inoculation of sinuses of normal turkeys with exudate from affected turkeys. The incubation period was 5–10 days. Sinuses of inoculated turkeys became swollen and contained a viscous exudate which later caseated. The infective agent was cultivated in the yolk sac of chick embryos through 28 passages. A small coccoid body was demonstrated in yolk sac smears which morphologically resembled bodies of the lymphogranuloma-psittacosis group.—F. D. ASPLIN.

LÖFGREN, S., & LUNDBÄCK, H. (1950.) **Isolation of a virus from six cases of sarcoidosis (Lymphogranulomatosis benigna Schaumann).** *Acta med. scand.* **138.** 71–75. [In English. Authors' summary copied *verbatim.*] **2571**

A virus has been isolated from every one of six cases of sarcoidosis investigated. Preliminary tests show that the virus probably belongs to the influenza—mumps—Newcastle disease group of viruses. It propagates readily in the embryonated egg and agglutinates red cells from a number of species. It fixes complement in the presence of sera from patients suffering from sarcoidosis or convalescent from mumps. The implications of these findings are briefly discussed.

RHODES, A. J., CLARK, E. M., KNOWLES, D. S., & GOODFELLOW, A. M. (1950.) **Prolonged survival of human poliomyelitis virus in experimentally infected river water.**—*Canad. J. publ. Hlth.* **41.** 146–149. [Authors' conclusions slightly modified.] **2572**

The authors have shown that a strain of human poliomyelitis virus in stool survives after addition to river water for at least 188 days, and retains its property of inducing paralysis in rhesus monkeys. Storage of the infected water was at approximately +4° C., and the dilution of the human stool was about 1:200. The material was prepared by ultracentrifugation and after treatment of the deposit with ether and antibiotics, the material could be inoculated cerebrally in monkeys. The fact that poliomyelitis virus can survive for such a prolonged period under experimental conditions would seem to have some epidemiological implications. The use of the high-speed centrifuge affords a means of examining water samples collected in field studies.

FABER, H. K., SILVERBERG, R. J., & DONG, L. (1950.) **Studies on entry and egress of poliomyelitis infection. II. Entry and spread after exposure of the trigeminal nerve.**—*J. exp. Med.* **91.** 549–560. [Authors' summary copied *verbatim.*] **2573**

Direct exposure to poliomyelitis virus of the central end of a cut branch of the V cranial nerve [of rhesus monkeys] was followed by centripetal spread of infection to the semilunar (Gasserian) ganglion, involvement of which was detected both histologically and by subinoculation as early as the 3rd day. In some instances infection did not progress further; in others it spread into the CNS with initial involvement of the trigeminal centers in the pons and medulla as early as the 4th day and by the 5th day was further advanced but still limited to the brainstem. Once infection was established it progressed both rostrally and caudally, at times with great rapidity, through the brainstem and reached the cord on the 6th or a later day. Incidental exposure in traumatized muscle of peripheral fibers of the VII motor nerve led in some instances to spread along that pathway directly into the CNS.

Application of the experimental results to human poliomyelitis is of interest chiefly in four respects. (1) The ascent of infection from a peripheral ganglion of the head area to the CNS with initial encephalitis of the brainstem and subsequent descent to the spinal cord is believed to parallel the evolution of the human disease as suggested by the character and order of development of the early symptoms and signs. (2) The failure in some instances of infection to spread from an infected peripheral ganglion to the CNS may parallel inapparent ("subclinical") poliomyelitis in man. (3) Invasion of virus through traumatized muscle directly to the CNS also has possible analogues in human experience which will be discussed in a later paper. (4) The presence of well marked and sometimes extensive lesions in the brainstem one or more days before symptoms emerge is also believed to parallel the human case.

COURTNEY, K. O. (1950.) **Report on the recent outbreak of jungle yellow fever in Panama.**—*Amer. J. publ. Hlth.* **40.** 417–426. **2574**

A general paper on work undertaken in a recent outbreak in human beings. In some preliminary tests done to ascertain the extent of infection in monkeys in the forests of the area concerned 30 % yielded positive reactions.

WHITTICK, J. W. (1950.) **Necropsy findings in a case of Q fever in Britain.**—*Brit. med. J.* 29th April. pp. 979–980. [Author's summary copied *verbatim.*] **2575**

A description is given of the pathological changes in the first fatal case of Q fever reported in this country. The patient, a man of 78, died of pneumonia after an acute febrile illness lasting 11 days. All who took part in the necropsy became infected, probably by inhalation.

Numerous rickettsiae were found in the pneumonic exudate, which was predominantly of mononuclear cell type, in lesions of brain, testis, and spleen, and also in the kidneys. This is the first recorded occasion on which they have been demonstrated in human tissues.

PAYZIN, S. (1949.) Türkiyede Q Hummasi Epidemiyolojisi. [**Epidemiology of Q fever in Turkey.**] *Türk İjiyen ve Tecrübi Biyoloji Dergisi.* **9.** 101–110. [In English pp. 111–120.] [Abst. in *Trop. Dis. Bull.* **47.** 129 (1950), copied *verbatim.* Signed: JOHN W. D. MEGAW.] **2576**

The results of complement-fixation tests carried out by the author and others suggest that Q fever is endemic all over the country among human beings, sheep, goats, and cattle. Among 127 sera sent for the Wassermann test there were 14 reactions, at titres ranging from 1–10 to 1–40. Among 741 sera from pneumonia patients there were 188 reactions at titres of 1–10 to 1–320; there were 68 reactions at titres of 1–80 and over. An analysis of 98 positive reactions showed that 57 occurred among farmers and 'animal contacts'.

No immunological differences were found between strains of *Rickettsia burneti* isolated in Ankara, Izmir, and Morocco.

SIGEL, M. M., SCOTT, T. F. McN., HENLE, W., & JANTON, O. H. (1950.) **Q fever in a wool and hair processing plant.**—*Amer. J. Publ. Hlth.* **40.** 524–532. [Authors' summary copied *verbatim.*] **2577**

An outbreak of Q fever occurred in Philadelphia among workers in a wool processing plant. The diagnosis was made by means of the complement-fixation test. The serologic and epidemiological features of this outbreak are discussed. It is recommended that Q fever antigen be used along with the other available antigens of pneumotropic viruses in testing sera of all cases of atypical pneumonia and undifferentiated infections of the upper respiratory tract. To the other industrial occupations associated with the risk of acquiring Q fever (dairy, meat, stock handling) must be added the occupation of handling and processing of raw wool and goat hair.

LUOTO, L., & HUEBNER, R. J. (1950.) **Q fever studies in Southern California. IX. Isolation of Q fever organisms from parturient placentas of naturally infected dairy cows.**

—*Publ. Hlth Rep., Wash.* **65.** 541–544. [Authors' summary slightly amended.] **2578**

A number of parturient placentas of infected dairy cows have been shown to contain *Rickettsia burneti*, sometimes in large quantities. This fact may be important in the spread of Q fever to susceptible persons and animals exposed to dairy and other livestock environments.

JELLISON, W. L., WELSH, H. H., ELSON, B. E., & HUEBNER, R. J. (1950.) **Q fever studies in Southern California. XI. Recovery of *Coxiella burnetii* from milk of sheep.**—*Publ. Hlth Rep., Wash.* **65.** 395–399. [Authors' summary slightly amended.] **2579**

Two of 300 cases of Q fever in southern California gave histories of contacts that specifically suggested sheep as a source of infection. Low titered reactions with Q fever antigens were demonstrated in the complement fixation test by sera of sheep from one flock. Lacteal secretions from these sheep produced Q fever in test animals, and a strain of *Rickettsia burneti* was established in guinea pigs and was identified by accepted criteria.

BOVARNICK, M. R., MILLER, J. C., & SNYDER, J. C. (1950.) **The influence of certain salts, amino acids, sugars, and proteins on the stability of rickettsiae.**—*J. Bact.* **59.** 509–522. [Authors' summary copied *verbatim.*] **2580**

It has been found that the survival of two strains of *Rickettsia prowazeki*, one strain of *Rickettsia mooseri*, one strain of *Rickettsia tsutsugamushi* (*orientalis*), and one strain of *Dermacentroxenus rickettsi* is favored by the following factors: (1) the presence of 0·005 M glutamate; (2) a pH close to 7·0; (3) a basal salt solution high in K^+ rather than one high in Na^+; and (4) the presence of 0·1 to 1 per cent serum albumin, bovine or human.

For the preservation of viability during freezing and thawing a variety of substances may be used, but of those tested only sucrose and albumin will also favor survival of the rickettsiae at room temperature. For this purpose sucrose may be used in concentrations between 0·05 M and 0·22 M; albumin must be present in a concentration of 4 to 6 per cent.

A useful medium for the preservation of rickettsiae for several hours at room temperature or 0° C. and during freezing and thawing is one containing sucrose, 0·218 M; KH_2PO_4, 0·0038 M; K_2HPO_4, 0·0072 M; and glutamate, 0·0049 M. It may be further improved by the addition of 1 per cent serum albumin.

IMMUNITY

BANKS, T. E., FRANCIS, G. E., MULLIGAN, W., & WORMALL, A. (1950.) **The precipitin reaction and antibody valence studied with the aid of radioactive isotopes. [Correspondence.]** —*Nature, Lond.* **165.** 111–112. **2581**

The small amounts necessary for the determination of the presence of radio-active elements makes them useful in the study of the molecular ratios involved in the antibody antigen reaction. Experiments are reported on the inhibiting action of 3:5 diiodotyrosine on the precipitin reaction between iodinated ovalbumin (containing iodine 131) and its antibody. It is considered that the results obtained support the view that antibodies are univalent in the sense that each molecule has only one specific combining group for the corresponding antigen.—E. EDEN.

BOYDEN, S. V. (1950.) **Adsorption by erythrocytes of antigens of *Pfeifferella mallei* and *Pfeifferella whitmori*.**—*Proc. Soc. exp. Biol., N.Y.* 289–291. [Author's summary copied *verbatim.*] **2582**

Erythrocytes of the horse and some other species treated with mallein were rendered thereby agglutinable by high dilutions of anti-mallein sera and by the serum of a human patient suffering from infectious melioidosis. Erythrocytes of ox and pig could not be sensitized to agglutination under the same conditions. The sensitization by mallein of horse red cells to agglutination by antimallein sera was inhibited by an alcohol-ether extract of these cells.

LARSON, C. L. (1949.) **Immunization of guinea pigs with a soluble antigen obtained from *Brucella abortus*.**—*J. Immunol.* **63.** 471–478. [Author's conclusions copied *verbatim.*] **2583**

An antigen is released into the aqueous phase following extraction with ethyl ether of *Brucella abortus* suspended in 0·85 per cent salt solution.

Incorporation of this soluble antigen into Freund's adjuvant without addition of tubercle bacilli does not enhance its antigenicity in guinea pigs.

Incorporation of this soluble antigen into Freund's adjuvant containing dried heat-killed human tubercle bacilli increases the antigenicity of the preparation so that 80 per cent. to 100 per cent of guinea pigs are immune to infection with multiple infective doses of virulent *Br. abortus*.

SHAW, L. W., HOWELL, A., JR., & WEISS, E. S. (1950.) **Biological assay of lots of histoplasmin and the selection of a new working lot.**—*Publ. Hlth. Rep., Wash.* **65.** 583–604. [Authors' summary slightly modified.] **2584**

Early in 1948 the supply of histoplasmin (H-15) employed by the Division of Tuberculosis

in most of its studies of histoplasmin sensitivity was nearly exhausted. This paper describes the procedures used in developing a large new lot of histoplasmin to replace H-15.

Histoplasmin lots, like most biological preparations, are known to differ in potency. Since there was no standard reference product, it was decided to achieve continuity in the research programs by adjusting the potency of the new material to match the old. This was done by determining what dilution of the new material would match the previously used 1:1000 dilution of H-15, arbitrarily called 'the standard'. The estimation of the matching dilution followed the testing of three trial dilutions. Each trial dilution was compared to the standard by human skin testing in which the standard was placed in one arm and the trial dilution in the other. A sensitive measure of the relative potency of each trial dilution, called the critical difference, consisted of the difference of two percentages: (1) The percentage of persons whose reaction to the standard was larger; (2) The percentage of persons whose reaction to the trial dilution was the larger. Critical differences for the three trial dilutions permitted estimation of a matching dilution associated with a zero critical difference, i.e., with equality of the two percentages.

Four lots of histoplasmin were considered in the selection of the new product. Tests of each lot and certain combinations of the lots led to the final selection of a pooled lot involving three of them. The estimated matching dilution for this pooled lot (H-42) was 8:1000. Considerable use of a lot H-40 was made during the period of development of H-42. Comparison of this lot with H-15 indicates a matching dilution of approximately 3:1000. Estimates of the relative potency 1:1000 H-40 compared to the standard were made.

Tests of a lot of histoplasmin now being distributed by a commercial firm revealed that a 1:100 dilution of this material (lot B-8287) was approximately equivalent to 1:1000 H-15.

Incidental to these assays, duplicate tests with the standard product were made to provide an estimate of the reproducibility of the histoplasmin skin test. The analytical method employed (critical differences) appears to be fairly successful in achieving the objectives of the assay, namely, estimating the matching dilution for an unknown product. Comparisons of the method with other techniques of assay are beyond the scope of this report, but it is planned to undertake such a comparison in an independent study.

HEMMERT-HALSWICK, A. (1949.) Allergie. [**Allergy.**] *Mh. Vet.-med.* **4.** 163–170. **2585**

Allergy is not of purely theoretical interest. It helps to explain why in glanders or in tuberculosis sometimes exudative, sometimes productive processes predominate; and in these two diseases allergic diagnostic methods are valuable. BCG inoculation should prove successful in the campaign against bovine tuberculosis. Heredity is important in many allergic diseases.—W. R. BETT.

THOMPSON, G. C., & MILLIFF, J. H. (1948.) **Anaphylactic granuloma in a stallion.**—*J. Amer. vet. med. Ass.* **113.** 158–159. **2586**

The authors report the appearance of several small hard non-capsulated swellings with irregular outlines on the back of a stallion three weeks after a tetanus antitoxin injection, these areas being remote from the site of injections. A second antitoxin injection was given four weeks after the first and four days later three more plaques formed on the left side of the neck. There was a history of tetanus toxoid having been given five years previously.

Sections of one lesion showed a marked infiltration of eosinophiles and a slight infiltration of lymphocytes, plasma cells and histiocytes in the dermis. Small demarcated areas up to 300μ in diameter were found throughout the area. Some contained calcified material and an occasional giant cell. In others there were cells undergoing coagulative necrosis. The epidermis and accessory skin structures did not appear to be involved in the lesion.—I. W. JENNINGS.

SCHWAB, L., MOLL, F. C., HALL, T., BREAN, H., KIRK, M., HAWN, C. VAN Z., & JANEWAY, C. A. (1950.) **Experimental hypersensitivity in the rabbit. Effect of inhibition of antibody formation by X-radiation and nitrogen mustards on the histologic and serologic sequences, and on the behaviour of serum complement, following single large injections of foreign proteins.**—*J. exp. Med.* **91.** 505–526. [Authors' summary copied *verbatim.*] **2587**

X-radiation and nitrogen mustard administration inhibit the formation of precipitins for whole bovine serum and bovine serum gamma globulin in the rabbit. When specific antibody formation is inhibited by these agents, intravenous injection of a single large dose of bovine serum gamma globulin is not usually followed by the development of tissue lesions 9 to 11 days later, as occurs fairly regularly in control animals.

A fall in titre of serum complement to very low levels for 3 to 5 days is closely correlated in time with the disappearance of antigen from the circulation following the intravenous injection of single large doses of bovine serum albumin and bovine serum gamma globulin. A rise in complement titre to normal levels occurs as antibodies appear in the serum. This sudden fall in comple-

ment titre is correlated with the development of characteristic lesions, and does not occur when antibody formation is inhibited.

The data presented are interpreted as evidence in favor of the concept that the lesions are due to a reaction between antigen fixed in or on tissue cells and circulating antibody. The possible significance of serum complement in the pathogenesis of anaphylactic tissue lesions is discussed.

BLACK-SCHAFFER, B., MILAM, J. W., BROCKMAN, D. D., COONRAD, E. V., & SILVERMAN, S. B. (1950.) **Production of the Shwartzman phenomenon by a single-injection technic.**—*J. exp. Med.* **91.** 539–548. [Authors' conclusions copied *verbatim.*] **2588**

In the hypersensitive animal a single inoculation of homologous antigen mixed with Shwartzman preparatory toxin may lead to the production of a Shwartzman reaction which functions as an amplifier of the antigen-antibody tissue response. The combination of antigen and bacterial toxin does not alter the antigenicity of purified bovine gamma globulin. This form of the Shwartzman phenomenon may be useful in the investigation of hyperergic tissue reactions.

DIXON, F. J., & WARREN, S. (1950.) **Antigen tracer studies and histologic observations in anaphylactic shock in the guinea pig. Pt. 2.**—*Amer. J. med. Sci.* **219.** 414–421. [Authors' conclusions copied *verbatim.*] **2589**

In anaphylactic shock in the guinea pig induced by egg albumin there is edema formation and a concentration of antigen in the bronchial fibrous tissue similar to that previously reported for bovine gamma globulin. This antigen localization seems to be a binding of specific antigen at the site of one of the sensitivity reactions, the bronchial wall. The bronchial stenosis present at the time of death in albumin induced anaphylactic shock is caused primarily by smooth muscle contraction present about some of the bronchi, and to a lesser degree by moderate edema formation in the collagenous connective tissue about most of the bronchi. Egg albumin is rapidly lost from the blood stream. Part of this loss is caused by renal excretion.

HARRIS, T. N., & HARRIS, S. (1950.) **Biological and technical factors in the demonstration of antibody production by lymphatic tissue.**—*J. Immunol.* **64.** 45–56. [Authors' summary copied *verbatim.*] **2590**

A number of biologic and technical factors were explored which may play a role in the demonstration of formation of antibodies in the popliteal lymph node of the rabbit. In a series of rabbits, some of which received 0·2 ml. of a suspension of dysentery bacilli in one hind foot pad and others five times that amount, it was found that the popliteal lymph node of the injected leg contained relatively more antibody, in comparison with the opposite node, in the case of rabbits receiving the smaller dose. Extracts of these lymph nodes showed no difference in content of antibody to an antigen which had been injected subcutaneously elsewhere in the body. In the centrifugation of antibody-containing lymph certain technical precautions were indicated which can reduce the amount of lymph plasma in and about the lymph cells to a point where the plasma does not interfere with the demonstration of higher antibody titers in the lymph cells.

Certain apparent discrepancies in data and interpretation of recent work on the formation of antibodies in lymphatic tissue are discussed in the light of the data presented here.

See also absts. **2482** (anthrax antigen); **2486** (BCG); **2504** (pullorum disease); **2534** (F. & M. disease); **2535** (F. & M. disease and vesicular stomatitis, differential diagnosis); **2538–41** (rabies); **2543** (vaccinia); **2545** and **2568** (haemagglutination-inhibition); **2547** (agglutinability of an influenza strain); **2736** (simultaneous complement-fixation test for dourine and glanders).

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

DAVID, W. A. L. (1950.) **Sodium fluoroacetate as a systemic and contact insecticide. [Correspondence.]**—*Nature, Lond.* **165.** 493–494. **2591**

Sodium fluoroacetate was found to be effective as an insecticide against *Aphis fabae* on broad beans not only when sprayed on the leaf, but also when absorbed from the soil by the plant, a concentration of 1 mg. per kg. of plant tissue being present. Preliminary tests against other insects were also successful. Sodium fluoroacetate appears to be more toxic than phosphonous anhydride. D. suggested that it should not be used without further experiments as it is also toxic to plants and mammals.—E. EDEN.

BRUCE, W. G., SMITH, A. L., & SKIPPER, C. C. (1946.) **Screwworm survey of the south-eastern States in 1945.**—*Florida Ent.* **29.** 1–4. [Abst. in *Rev. appl. Ent.* Ser. B. **37.** 191 (1949), copied *verbatim.*] **2592**

The following is substantially the authors' summary. Surveys of *Callitroga hominivorax*, Coq. (*Cochliomyia americana*, Cush. & Patt.) on livestock in the south-eastern United States in 1945 showed infestations to be widespread in Florida, Georgia, and Alabama, and light to heavy in south Carolina. They reached outbreak proportions in Alabama and south-western Georgia. Climatic conditions throughout the spring and summer were favourable for the development and migration of

C. hominivorax. The practice of approved control measures prevented a more serious outbreak.

VAZ, Z., & ROCHA, U. F. (1946.) *Tunga penetrans* (L. 1758), "bicho do pé" em gado bovino. Importância clínica, observações parasitológicas e tratamento pelo D.D.T. [*T. penetrans* **in cattle. Clinical importance, parasitological observations, and control by D.D.T.**]—*Livro Homen. Ferreira d'Almeida.* pp. 327–331. São Paulo; Soc. brasil. Ent. [Abst. in *Rev. appl. Ent.* Ser. B. **38.** 46. (1950), copied *verbatim.*] **2593**

In view of the scanty references to infestation of hosts other than man and pigs by *Tunga penetrans*, L., the authors record a severe infestation of cattle in São Paulo by fleas thought to be of this species. They were mostly concentrated at the growing point of the hooves, and the resulting ulceration was severe. Secondary infections became established in some cases, and some of the animals were so lamed that they were incapable of walking or even of standing. In tests of control by other than surgical means, five animals were freed from infestation by treatment of the hooves with a 5 per cent. solution of DDT in benzene, and after this had dried, an ointment consisting of 5 per cent. DDT in vaseline.

WORSLEY, R. R. LE G. (1950.) **Benzene hexachloride as a cattle dip.**—*E. Afr. agric. J.* **15.** 127–145. **2594**

Because arsenic is so poisonous, trials of the newer insecticides were undertaken. After preliminary laboratory trials had indicated that D.D.T. is less effective than benzene hexachloride (B.H.C.) against the brown tick, *Rhipicephalus appendiculatus*, and this fact had been confirmed in a small-scale field trial, large-scale field trials of B.H.C. were carried out. B.H.C. used in the form of a toluene-turkey red oil-soft soap emulsion, or either of the two commercial dips containing B.H.C. which are at present on the market, was at least as good as arsenic tick dips. The dipping interval cannot be extended beyond seven days, and "preferential" removal of B.H.C. from the bath constitutes a serious problem.

When cattle and sheep are fed B.H.C., their blood becomes toxic to the brown tick.

—G. B. S. Heath.

See also absts. **2551** (arthropods and Japanese B encephalitis); **2553** (ticks in equine encephalomyelitis); **2667** (phenothiazine).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

OLSEN, O. W. (1949.) **Fasciolicidal efficacy of hexachloroethane-bentonite suspension in goats.**—*Amer. J. vet. Res.* **10.** 71–73. **2595**

Tests of the efficacy of a single dose of 30 ml. of a hexachlorethane-bentonite suspension against fascioliasis in nine goats were carried out, equipment being used to collect the complete faecal output. The animals were killed 3–6 days after dosage and examined for the presence of flukes. The remaining 47 goats of the flock, 43 of which were known to be infected, were also treated, but under field conditions.

With the exception of one of the experimental goats, which was in the last stages of fascioliasis and in which only 33 % of the flukes were killed, the average efficacy of the medication for the rest of the group was a 93 % kill. P.M. examinations indicated that the suspension was less efficient in cases of severe liver damage. The treatment was well tolerated; there was rapid improvement and no further deaths occurred.—M. L. CLARK.

OLSEN, O. W. (1949.) **Action of hexachloroethane-bentonite suspension on the rumen fluke,** *Paramphistomum.*—*Vet. Med.* **44.** 108–109. **2596**

A discussion of literature on the pathogenicity and treatment of paramphistomiasis; hexachlorethane-bentonite suspension removed all the rumen flukes from one cow, as judged by egg-counts, and most of the flukes from one sheep.

—GEORGE M. URQUHART.

BRACKEN, F. K., & OLSEN, O. W. (1950.) **Coenurosis in the chinchilla.**—*J. Amer. vet. med. Ass.* **116.** 440–442. [Authors' summary copied *verbatim.*] **2597**

The coenurus stage of the tapeworm *Multiceps serialis* in chinchillas is reported. Lesions, diagnosis, treatment, and control are discussed.

COCEANI, C. (1949.) Frequenza del Cysticercus bovis e del Cysticercus dromedarii tra gli Zebù eritrei. [**Incidence of Cysticercus bovis and C. dromedarii in Eritrean cattle.**]—*Boll. Soc. ital. Med. Igiene trop.* **9.** 295–299. [Abst. from English summary.] **2598**

C. Bovis or C. dromedarii was present in 155 of 531 Eritrean cattle examined. Both species were present in 24 cattle; in 99 C. bovis alone was present, and in 32 C. dromedarii alone.

KOWALEWSKA, H. (1949.) Stosunek bakteryi do torbieli bąblowców w wątrobie świń. [**The relation of bacteria to cysts of echinococcus in the liver of pigs.**]—*Med. weteryn.* **5.** 921–923. [English summary.] **2599**

In hydatid cysts of the liver in swine micro-organisms were rarely demonstrable. On the

other hand, bacteria were frequently present in the adjacent liver tissue.

TODD, A. C., HANSEN, M. F., KELLEY, G. W., & WYANT, Z. N. (1949.) **Continuous phenothiazine therapy for horses. Part I. Effect on the worm parasite.**—*Vet. Med.* **44.** 411–414. **2600**

Four groups of three horses each, all with strongyles, were given 0·5, 1, 2, and 4 g. respectively of phenothiazine daily on their grain ration for 52 weeks. One horse from each group was killed and examined P.M. at the end of the year, and egg counts were made weekly on all horses.

The two lower doses reduced the worm burden slowly and permitted increases in mid autumn; the two larger doses decreased it rapidly and did not, with one exception, permit a subsequent rise. The 4 g. dose was most effective. There was also an apparent decline in the fertility of the eggs passed as detected by microscopic methods. The number of worms recovered P.M. decreased with increasing doses, and all horses had fewer immature *S. vulgaris* in the anterior mesenteric artery (average 3·7) than is usual. Unfortunately, the experimental conditions favoured fairly heavy reinfestation of the horses; the authors consider that under better management a smaller dose (2 g. or even 1 g. daily) would be as effective as the 4 g. dose in this experiment.—H. G. Clark.

BLAISDELL, K. F. (1950.) *Arion circumscriptus*, **a new intermediate host of the cat lungworm,** *Aelurostrongylus abstrusus.* —*Cornell Vet.* **40.** 197–200. [Author's summary copied *verbatim.*] **2601**

Molluscs are the only necessary intermediate hosts of *Aelurostrongylus abstrusus. Arion circumscriptus* [a slug] is reported for the first time as an intermediate host of *A. abstrusus. A. abstrusus* is definitely pathogenic and may cause death in heavy infections.

ROGERS, W. P. (1949.) **On the relative importance of aerobic metabolism in small nematode parasites of the alimentary tract. I. Oxygen tensions in the normal environment of the parasites. II. The utilization of oxygen at low partial pressures by small nematode parasites of the alimentary tract.**—*Aus. J. sci. Res.* Ser. B. **2.** 157–165; 166–174. [Author's summaries copied *verbatim.*] **2602**

I. As a preliminary to the study of the relative importance of aerobic mechanisms in the metabolism of *Nippostrongylus muris*, *Nematodirus spathiger*, *Nematodirus filicollis*, and *Haemonchus contortus* at oxygen pressures of the normal environmental fluids of these parasites, the determination of oxygen in the contents of the small intestine of the rat and sheep, and the abomasum of the sheep, has been carried out. The method which was used allowed measurements to be made close to the mucosa of the alimentary canal of anaesthetized animals in which the circulation was left intact, and the procedure ensured that conditions in the normal gut were very little disturbed.

In the small intestine of the rat, oxygen tensions were found to vary from 30·2 to 8·9 mm. of mercury; these readings were usually lower as distances from the pylorus were increased. Oxygen was always present in the contents of the small intestine of the sheep close to the mucosa, but in smaller amounts than those found under similar conditions in the rat. As the oxygen tensions in regions very close to the intestinal mucosa of rats were influenced by the nature of the gases inspired by the animals, it is apparent that some oxygen diffused into the intestinal contents from the blood stream.

II. *Nippostrongylus muris*, *Haemonchus contortus*, *Nematodirus spathiger*, and *N. filicollis* are all capable of utilizing oxygen for respiratory purposes even when it is present at very low oxygen tensions. Thus with a partial pressure as low as 5 mm. of mercury the respiration of *Nippostrongylus muris* may reach 40 *per cent.* of its maximum rate, whereas *Nematodirus* spp. and *H. contortus* may respire at 25 and 12 *per cent.* of their maximum rates respectively. Further, the results indicate that *in vivo* the oxygen consumption rates may sometimes reach 80 *per cent.* of the maximum *in vitro* rate in the case of *Nippostrongylus muris* in the small intestine of the rat and 40 *per cent.* in the case of *Nematodirus* spp. in the small intestine of the sheep. *Haemonchus contortus* in the sheep abomasum probably respires at a relatively lower rate than either of the intestinal parasites *in vivo.*

Evidence which indicates that the maximum uptake of oxygen by the parasites *in vitro* may be much higher than *in vivo* has been presented. It is concluded that the oxygen tensions of the host gut fluids surrounding the parasites in their normal habitat may not greatly limit oxygen uptake *in vivo* especially in the case of *Nippostrongylus muris.*

The oxygen consumption–oxygen tension curve for *Nippostrongylus muris* followed a hyperbolic course. When the results were treated according to the equation

$$A = \frac{P}{K_1 + K_2 P},$$

where A represents oxygen uptake, P is the oxygen pressure, and K_1 and K_2 are constants, P/A plotted against P gave a straight line with K_1, the intercept, of 1·2, and K_2, the slope, of 0·14. The sheep parasites gave similar results, with K_1 and K_2

values of 2·6 and 0·15 for *Nematodirus* spp., and 10 and 0·14 for *Haemonchus contortus*.

Mechanisms of oxygen transport used by the parasites are discussed.

MAYHEW, R. L. (1949.) **The results of feeding small amounts of phenothiazine in pure infections of the nodular worm.**—*J. Parasit.* **35.** 12. [Only abst. given, copied *verbatim*.] **2603**

The calves used in these experiments were raised parasite free and inoculated with pure cultures of infective nodular-worm larvae. From 10 to 20 fecal examinations (usually daily) were made after eggs began to appear in the manure before beginning the experiment. One and one-half grams of phenothiazine was mixed with the grain concentrate at the regular evening feeding for 6 days to 4 calves and for 14 days to three others.

Daily fecal examinations failed to demonstrate the presence of eggs in the manure in all animals except on (No. 194) in from 6 to 14 days after the first feeding of the drug. In the case of No. 194 one of the animals fed for 6 days, the number of eggs became greatly reduced after 6 days, and 4 days after the beginning of a second 6 day feeding 21 days later they disappeared altogether.

Abnormal eggs (irregular cell divisions, failure to divide, dark pigmentation, and degeneration) were noted in manure samples from one group of animals taken 16 hours after the first feeding. Abnormal eggs were not noted in samples taken from another group of animals approximately 8 to 10 hours after the first feeding, but were detected in samples collected 18 to 20 hours later.

One calf that was fed 6 days and kept 8 weeks under controlled conditions still remained negative. Another animal remained negative 7 weeks, after which time a relatively small number of eggs was recovered from the manure. Two animals that had been fed 6 days were killed after 10 negative daily fecal examinations were obtained and adult nodular worms were removed from both animals.

TODD, A. C., KELLEY, G. W., & HANSEN, M. F. (1950.) **Critical tests with sodium fluoride as an anthelmintic for ascariasis in horses.**—*Amer. J. vet. Res.* **11.** 26–28. **2604**

Ten horses were given by stomach tube sodium fluoride dissolved in water at the rate of 2·5 g. per cwt. body weight; ten other horses were given 1·5 g. per cwt. The animals were slaughtered 24 hours after dosing and the number of living and dead *Parascaris equorum* counted. The efficiency of the higher dose as an ascaricide was 89·4 %, whereas that of the lower one was only 49·3 %. At either rate of administration, immature ascarids were as susceptible to the action of sodium fluoride as mature ascarids. Diarrhoea, moderate gastritis and enteritis, haemo-concentration, leucocytosis and haemolysis were observed following treatment.

—E. EDEN.

BALDWIN, E., & MOYLE, V. (1949.) **A contribution to the physiology and pharmacology of *Ascaris lumbricoides* from the pig.**—*Brit. J. Pharmacol.* **4.** 145–152. **2605**

The reactions of exposed *Ascaris* muscle and segments still covered with cuticle to various drugs were studied and the results obtained were compared with the behaviours of annelid muscles. *Ascaris* muscle was stimulated by acetylcholine, choline, nicotine, barium ions and 2,268 F (ethylal-trimethylammonium-propanediol). This effect could be antagonized by tubocurarine, strychnine, and cocaine but not by atropine or an excess of nicotine, indicating that no cholinesterase is present in these muscles. The following drugs had no direct action: adrenalin, caffeine, ephedrine, ergotoxin, eserine, histamine, morphine, pilocarpine, and strychnine. These results further substantiate the findings that there are many important differences between the muscles of parasitic nematodes and free living annelids; the latter should not therefore be used for the determination of anthelmintic potency of drugs.—E. EDEN.

MARTIN, H. M. (1950.) **Observations on the anthelmintic value of substituted phenolic compounds in dogs.**—*Amer. J. vet. Res.* **11.** 58–69. **2606**

Among the 26 substituted phenolic compounds used for removing ascarids, hookworms, and tapeworms those giving the best results were 2-tertiary-butyl-4-bromophenol, 3,5-dimethyl-4-chlorophenol, the mixed (secondary and tertiary)-2-amylphenol and the technical grade of 6-tertiary-butyl-*m*-cresol. None of the compounds studied were effective against whipworms. No definite relationship between the chemical structure of the compounds and their anthelmintic action was obtained.—E. EDEN.

ACKERT, J. E., & GAAFAR, S. M. (1949.) **Phosphorus deficiency a limiting factor in fowl parasitism.**—*J. Parasit.* **35.** 11. [Only abst. given, copied *verbatim*.] **2607**

Studies on the effects of mineral supplements on the resistance of chickens to the nematode, *Ascaridia galli*, give evidence that a deficiency in phosphorus not only affects the chickens, but also the ascarid parasites.

Rations high in calcium content and low in phosphorus given to chickens parasitized with approximately 200 *A. galli* eggs resulted in average ascarid infections of 3·3, 2·5, 10·5 and 3·3 worms, respectively, in four consecutive experiments. Whereas, control chickens on optimal amounts of

calcium and phosphorus yielded worm averages as follows: 9·6, 7·1, 24·2 and 6·4.

To determine whether the reduced number of *A. galli* was due to the high calcium or the low phosphorus, a group of control chickens was injected with calcium boro-gluconate intramuscularly throughout the period of the experiments with the result of an average of 8·1 worms as compared with 3·3 in the high calcium-low phosphorus group and with 6·4 worms in the controls.

The results of these four experiments on 225 young chickens indicate that a deficiency of phosphorus in the ration is a limiting factor in ascarid infections of fowls.

CALL, C. (1949.) Segnalazione di microfilarie sanguicole della lepre e faraona eritree. [**Microfilaria in the blood of a hare and of a guinea-fowl in Eritrea.**]—*Boll. Soc. ital. Med. Igiene trop.* **9.** 303–308. [English summary copied *verbatim.*] **2608**

The author refers to two microfilaria found in Eritrea in the blood of the hare and guinea fowl. They are similar to those which have been noted in the same animals in the Anglo-Egyptian Sudan.

KLESOV, M. D. (1949.) [**The biology of the nematode *Thelazia rhodesii* Desmarest, 1827.**]—*Dok. Akad. Nauk SSSR.* **66.** 309–311. [Abst. in *Helminth. Abstr.* **18.** 85. (1950), copied *verbatim.* Signed: C. R.] **2609**

Klesov has found that, in the Ukraine, the intermediate hosts for *Thelazia rhodesii* are *Musca larvipara* and *M. autumnalis.* Only those animals which are in the open become infected. *Stomoxys calcitrans*, other blood-sucking insects and *Musca domestica* are of no importance in the transmission of *Thelazia rhodesii.*

PETROCHENKO, V. I. (1949.) [**Elucidation of the life-cycle of the acanthocephalan *Polymorphus magnus* Skryabin, 1913, parasite of domestic and wild ducks.**]—*Dok. Akad. Nauk SSSR.* **66.** 137–140. [Abstr. in *Helminth. Abstr.* **18.** 85. (1950), copied *verbatim.* Signed: C. R.] **2610**

In a district where great mortality in ducks was caused by *Polymorphus magnus*, Petrochenko found that out of 455 *Gammarus* (*Rivologammarus*) *lacustris*, 373 (82 %) were infected with acanthocephalan larvae. When fed to ducklings they produced *Polymorphus magnus. Gammarus lacustris* was experimentally infected with eggs of *P. magnus.* The development of larvae took 54–60 days. Petrochenko then fed 15 ducklings, eight days old, with about 150 *Gammarus* collected from a lake and found that complete development in the definitive host took 27–30 days.

See also absts. **2522** (ascarids and coccidiosis); **2524** (worm infestation and piroplasmosis in horses); **2666** (phenothiazine).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

STRONG, L. C. (1950.) **Litter seriation and the invasion of fibrosarcomas in mice.**—*Yale J. Biol. Med.* **22.** 303–307. [Author's conclusions copied *verbatim.*] **2611**

The characteristic of invasiveness of chemically induced fibrosarcomas is partially determined by some new principle found in the host which has been derived from its ancestry and is differentially determined by litter seriation.

The number of mice developing chemically induced fibrosarcomas that have the capacity to invade the abdomen is gradually reduced in successive litters of the same breeding parents.

FRIEDEWALD, W. F., & ROUS, P. (1950.) **The pathogenesis of deferred cancer. A study of the after-effects of methylcholanthrene upon rabbit skin.**—*J. exp. Med.* **91.** 459–484. [Authors' summary copied *verbatim.*] **2612**

The ears of young adult rabbits were painted with methyl-cholanthrene (MC) long enough to call forth a few benign tumors (papillomas, frill horns), and the animals were followed throughout their later lives. Soon after the paintings were stopped the tumors began to dwindle and vanished, yet even while they were disappearing other growths of the same kinds arose, only to vanish later in their turn. For a long while more arose than disappeared, and in consequence the number of tumors increased throughout years. They accumulated at a constant rate despite concurrent changes in the supporting skin, which might have been supposed, on previous experience, to have prevented this from happening. Only in the old age of the animals did the number of tumors eventually fall off, and by this time the skin on which they had arisen, long since normal in the gross to all appearance, had become nearly so microscopically. Even then latent neoplastic potentialities still existed in the cutaneous tissue; where punch holes were healing new tumors arose.

A great multitude of hidden neoplastic cells were present in the MCed skin, and from them many of the growths called forth by the stimulus of healing undoubtedly derived. Yet the facts make it difficult to suppose that the long accumulation, at a constant rate, of tumors visible in the gross was due wholly to the proliferation of cells

rendered neoplastic during the period of exposure to MC, and lying hidden afterwards for periods determined by their differing, evenly graded capabilities. Nor can the accumulation be attributed to a sustained carcinogenesis resulting from the pathological state of the skin. As a whole the findings indicate that the linear increase in growths was due for the most part to a continual arrival at the neoplastic state and subsequent proliferation of cells, or the descendants of cells, that had been no more than started on the way toward becoming neoplastic by the carcinogen. There is clinical evidence for such a course of events.

Now and again a carcinoma arose from the skin previously treated with MC, but they were few in all, as would follow from the presence of local conditions unfavorable to malignant change. Some appeared only after years,—in one instance more than 5 years later.

The occurrence of deferred cancer in man can be understood in terms of the findings in rabbits.

NUTRITIONAL AND METABOLIC DISORDERS

BREIREM, K. (1948.) **Experiences and research work in the field of animal nutrition in Norway during the war 1939–1945.** [Reprint of a paper read before the British Nutrition Society, July 8th 1946.] pp. 19. Oslo: Institute of Animal Nutrition, Royal Agricultural College of Norway. Reprint No. 50. **2613**

This is a concise but comprehensive account of how the war years affected animal nutrition under German occupation in Norway. The change-over to food production for direct human consumption, as well as German preference for protein in the somewhat one-sided exchange between the two countries, led to a reduction in the number of all farm animals kept (except for horses and ewes), but also stimulated research into (*a*) the production and evaluation of substitute feeds, and (*b*) the occurrence and causes of deficiency diseases.

The investigation of substitute feeds included the study of wood cellulose, Beckmann-treated straw, urea, fodder yeast, forest waste (leaves), heather, lichen and cooked kitchen waste, as well as such home grown feeds as root tops for cows, potatoes for pigs and fowls, etc.

In the field of deficiency diseases, research covered deficiencies of mineral factors in ruminants and of vitamin B_1 in foxes, as well as nutrition and lactation diseases in dairy cows, the latter with particular regard to extreme cellulose feeding and energy shortage as factors responsible for the increase in hypomagnesaemia, acetonaemia, and tetany.

Miscellaneous problems studied included the effect of the degree of extraction for grain upon human and animal nutrition, the effect of wartime feeding upon various milk constituents and upon the phosphatase of the blood serum of lactating cows, and, lastly, the value of heart girth measurements in estimating the live weight of cattle.

This useful survey is supported by a good bibliography.—G. P. MARSHALL.

—. (1948.) **Inspection of commercial feedstuffs.** —*Control Series Bull. Mass. agric. Exp. Sta.* No. 136. pp. 1–24. **2614**

This report summarizes the results obtained on the composition of feeding stuffs sold in Massachusetts. All brands conforming with the guarantee are listed first. Others that are 1 % or more under guarantee in protein or fat, or are 1·5 % or more over guarantee in fibre content are listed next with details of the percentages guaranteed and those actually obtained on analysis. An acid insoluble ash content of 1·2 % or more was allowed only if it was declared on the containers. The report also contains detailed data on the quality and quantity of the ground oats sold. A claim of one firm for a "Sex Control Feed" for poultry could not be substantiated, hence it was withdrawn.

E. EDEN.

WHITTLES, C. L. (1949.) **Soil fertility and health.**—*Vet. Rec.* **61.** 38–39. **2615**

W. deals mainly with the major elements, and shows, by giving examples, that the application of lime may double the calcium content of grass; that cattle can detect plots in a field so treated, and will graze these bare while leaving the rest untouched; that systematic liming can reduce the incidence of milk fever; and that cheese-makers do not get a firm curd on farms where liming has been neglected. The problem of phosphate deficiency is linked with phosphate fixation, so the deficiency may be of available rather than total phosphate. The fixation may be reduced by increasing the organic matter content of the soil. Potassium accumulates in grassland, particularly on acid pastures, but the soil content falls rapidly during a hay crop.—J. O. L. KING.

LEGG, S. P., CURNOW, D. H., & SIMPSON, S. A. (1950.) **The seasonal and species distribution of oestrogen in British pasture plants.**—*Biochem. J.* **46.** No. 4. pp. xix–xx. of Proceedings. **2616**

Some pasture plants (cocksfoot, red clover, perennial and H.1. ryegrass) had considerable

oestrogenic activity, others (lucerne, white clover, and Timothy grass) however were devoid of this property. The early occurrence of oestrogenic activity in the leaves and its high concentration in the chloroplasts suggest that it is elaborated there. As oestrogen concentration is highest preceding flowering, its association with reproductive growth is also indicated.—E. EDEN.

DINNING, J. S., BRIGGS, H. M., GALLUP, W. D., ROSS, O. B., MOE, L. H., & BUTLER, R. L. (1949.) **Urea in livestock feeding.**—*J. Amer. vet. med. Ass.* **114.** 90–92. **2617**

In calves given urea as 2·8 % of the dry matter of a diet diuresis and kidney degeneration occurred, but bullocks tolerated 2·2–2·3 % over a prolonged period and 6·0 % for 70 days without the appearance of signs of poisoning. Acute poisoning was produced by giving 116 g. or more to bullocks by a short stomach tube, death occurring 40–90 min. later; the ammonia content of the blood was very high. That the dose might have by-passed the rumen, passing into the abomasum, was suggested by the fact that a large dose (236 g.) given by a longer tube, that passed right into the rumen, caused death after seven hours with none of the symptoms observed when the shorter tube was used.—R. MARSHALL.

BEZEAU, L. M., & GALLANT, T. B. (1950.) **Experiments on the self-selection of a diet by foxes.**—*Sci. Agric.* **30.** 150–156. [Authors' summary and conclusions copied *verbatim.*] **2618**

Six weanling pups, six half-grown pups, and four adult foxes were placed on a self-selection diet with 28 feeds from which to choose. None of the groups selected a nutritionally balanced diet since the fresh meat made up 98·8 per cent of the ration consumed in all groups. In both pup groups a rachitic condition developed even though cod-liver oil, bonemeal, and limestone were available to them. The results indicate that neither weanling pups, half-grown pups, nor adult foxes are able to select, from this large assortment of feeds, those which are essential to their growth and physiological well-being.

In a second experiment six pups were placed on a self-selection diet in which there were only seven feeds from which to choose. The results of this experiment showed that, even when fox pups have only a limited number of feeds from which to choose, they still are unable to select a nutritionally balanced ration.

MCDONALD, I. W. (1950.) **Microbial digestion in the alimentary tract. The nature of dietary protein in relation to its utilisation by the ruminant.**—*Advanc. Sci.* **6.** 347–348. **2619**

Organisms of the rumen are able to use nitrogen from sources other than amino acids for their growth and the subsequent digestion of these organisms yields protein to the host. Ammonia from hydrolysis of urea (in saliva and foodstuffs) and deamination of protein comprises the major part of the non-protein nitrogen. Some ammonia enters the portal blood and the liver converts it to urea, thus the cycle is set up, excretion taking place by saliva and loss occurring in the urinary excretion. It is this loss of urea in the urine which limits the technique of using urea as feeding stuffs.

When proteins are used as food materials, various amino acids are available to the organisms so that possibly a new assembly of amino acids is presented to the animal for digestion. The author points out that other factors affecting this utilization of protein by the ruminant are the influence of materials such as carbohydrates on the growth of the ruminal organisms, the digestability of the protein of ruminal organisms and the relative proportion of protein and non-protein nitrogen in these organisms.—J. H. HALE.

CUTHBERTSON, D. P., & CHALMERS, M. I. (1950.) **Utilization of a casein supplement administered to ewes by ruminal and duodenal fistulae.**—*Biochem. J.* **46.** No. 4. pp. xvii–xviii of Proceedings. **2620**

More casein nitrogen was retained when the casein was administered through a duodenal fistula than when it was dripped into the rumen. The effect of various diets and pregnancy on nitrogen retention is also tabulated. From the results obtained it was considered that the rate of deamination of the casein in the rumen was in excess of the capacity to synthesize bacterial protein, therefore the ammonia formed was absorbed through the blood and excreted in the urine. Thus the low plane pregnant ewes failed to use the casein supplement to meet their requirements for protein. —E. EDEN.

UDALL, R. H. (1947.) **Low blood magnesium and associated tetany occurring in cattle in the winter.**—*Cornell Vet.* **37.** 314–324. **2621**

A herd of beef breeding cows kept on pasture during the winter had low blood magnesium levels. At parturition many of these animals had signs of winter tetany associated with low calcium levels superimposed on the low blood magnesium levels. Treatment against tetany with calcium gluconate and dextrin was effective, whereas preparations containing magnesium were not of great benefit.—E. EDEN.

CARTTAR, M. S., MCLEAN, F. C., & URIST, M. R. (1950.) **The effect of the calcium and phosphorus content of the diet upon the formation and structure of bone.**—*J. infect. Dis.*

26. 307–331. [Authors' summary copied *verbatim.*] **2622**

The condition of the bone-calcium deposits was observed and the turnover of the body calcium stores was estimated from undecalcified histologic sections of the upper tibiae of rats on diets of various composition with respect to calcium and phosphorus.

The bones of animals on various diets classified in the literature as "adequate" show: (*a*) a relatively short metaphysis and therefore a relatively short supply of stored calcium, (*b*) great osteoblastic and osteoclastic activity which reflects the need for maximum turnover and utilization of the bone calcium, (*c*) osteoid borders on the trabeculae indicating that calcium salt is not being stored to the maximum capacity of the bone structure, (*d*) a porous shaft similar to that of very young animals.

The bones of rats on various diets classified by Sherman as "optimum" for growth and longevity show: (*a*) a relatively long and dense metaphysis which constitutes the maximum storage of bone salt, (*b*) diminished osteoblastic and osteoclastic activity which indicates minimum turnover and maximum conservation of calcium salt, (*c*) bone trabeculae calcified to the maximum density with no osteoid borders, which fact is evidence of an abundant and continuous supply of calcium and phosphorus in the diet and body fluids, (*d*) a very dense shaft similar to that of adults.

The bones of animals on diets in which the calcium intake alone is increased without increasing the phosphorus, show the deleterious results of this practice. Depending upon the absolute amounts of calcium added, the phosphorus is withdrawn from the diet in the intestinal tract in insoluble form and various changes occur in the bone in the following sequence: (*a*) incomplete calcification of the new bone as seen by osteoid borders of the trabeculae, (*b*) the zone of provisional calcification in the epiphyseal cartilage diminishes in depth or disappears completely, (*c*) invasion and removal of epiphyseal cartilage are retarded, resulting in the formation of a wide epiphyseal plate and a typical rachitic metaphysis.

On the basis of the above and other observations, various terms commonly used in describing the condition of the bones have been defined on an objective rather than a hypothetical basis.

Hendlin, D., & Ruger, M. L. (1950.) **The effect of cobalt on the microbial synthesis of LLD-active substances.**—*Science.* **111.** 541–542. **2623**

Vitamin B_{12}, a cobalt co-ordination compound, can be substituted for the *Lactobacillus lactis* Dorner factor (LLD) for the growth requirements of several micro-organisms. *Streptomyces griseus* on a medium of an enzymatic digest of casein and beef extract produced about three times as much LLD when small traces (1–2 p.p.m.) of Co^{++} were present. Although LLD activity is not identical with vitamin B_{12}, a more or less parallel increase in the vitamin production with increase in LLD activity was also observed. High concentrations of Co^{++} (20–50 p.p.m.) not only decreased LLD synthesis but also inhibited growth. In the other micro-organisms tested, the addition of 2 p.p.m. of Co^{++} also increased the LLD production in every case.—E. Eden.

Bijkerk, R. (1949.) Oriënterend onderzoek omtrent de Koperstofwisseling van gezonde en zieke paarden en runderen in verband met het gehalte aan koper van de lever. [**Copper content of equine and bovine livers.**]—*Tijdschr. Diergeneesk.* **74.** 943–944. **2624**

Radio-active copper was used to find the absorption rate and percentage of copper retention after oral administration. Results of determinations of the copper content of equine and bovine livers are also reported.—E. Eden.

Thompson, S. Y., Ganguly, J., & Kon, S. K. (1949.) **The conversion of β-carotene to vitamin A in the intestine.**—*Brit. J. Nutrit.* **3.** 50–78. **2625**

Experiments are reported from which it is concluded that the small intestine is the site of conversion of carotene to vitamin A, and that the lymphatic system is a route of transport of the vitamin so formed.

When rats, which were reared on a vitamin-A deficient diet so that there was no storage of vitamin A in the liver, and blood and intestine were also devoid of the factor, were given β-carotene by mouth, vitamin A appeared within 15 min. in the wall and contents of the small intestine, none being found in the stomach or large intestine. While the highest concentration of vitamin A within 15 min. to two hours after dosing was found in the middle region of the small intestine, the position of highest concentration of carotene shifted progressively towards the caecum with the passage of time. The first increase of vitamin A in the liver did not occur until 45–60 min. after dosing, and up to two hours after dosing there was more vitamin A in the small intestine than in the liver. Later, while the liver reserves continued to accumulate, the intestinal content of vitamin A gradually decreased.

If normal rats were kept for a short period on the deficient diet, vitamin A was almost entirely removed from the intestine, indicating that the intestine is not a storage place for the vitamin; liver stores and blood concentration were not appreciably affected. Feeding of β-carotene to

such rats was again followed by the appearance of vitamin A in the intestine. The rapid appearance of vitamin A in the small intestine after a meal of carotene was also demonstrated in normal pigs. In pigs, appreciable quantities of vitamin A could be detected in the mesenteric lymphatics at the same time as it appeared in increased quantities in the blood after administration of vitamin A or after a meal of carotene. With vitamin A-deficient rats, the characteristic fluorescence of vitamin A in ultra-violet light was seen within 30 min. after a carotene meal in the mesenteric lymph nodes and ducts, and within two hours in the thoracic duct.—E. Cotchin.

Cordiez, E. (1950.) Les réserves en vitamine A du veau nouveau-né. [**The vitamin A reserves of the newborn calf.**]—*Ann. Méd. vét.* **94.** 143–172. **2626**

The literature on the various treatments affecting the vitamin A reserves of new-born calves is discussed; in many cases experimental results are quoted in detail. On natural diets, the vitamin A reserves of new-born calves are low. These can be increased by supplementing the diet with vitamin A during the latter half of gestation. It is doubtful, however, whether this practice results in any significant improvement of the health of the new-born calf.—E. Eden.

Kahn, R. H., & Bern, H. A. (1950). **Antifolliculoid activity of vitamin A.**—*Science.* **3.** 516–519. **2627**

Ovariectomized rats were oestrogenized by subcutaneous implantation of α-oestradiol. When the vaginal smears became cornified under the influence of the hormone, vitamin A dissolved in various oils was applied intravaginally in 0·05 ml. daily doses. Vitamin A alcohol in acetone-sesame oil (1,250 I.U. per day) or in sesame oil (1,500 or 2,500 I.U. per day) greatly reduced the number of precornified and cornified cells, but the number of the nucleated vacuolated epithelial cells was increased. Acetone-sesame oil, sesame oil, or cod-liver oil dissolved in sesame oil (40 I.U. per day) produced no appreciable effect. The authors concluded that the presence of vitamin A in the epithelial cells may promote the synthesis of glycoproteins (mucin) rather than that of fibrous proteins (keratin). —E. Eden.

Cordiez, E. (1950.) L'influence du part sur le taux plasmatique de vitamine A dans l'espèce bovine. [**Influence of calving on vitamin A content of the blood.**]—*Ann. Méd. vét.* 94. 176-186. **2628**

The literature on the changes of the blood levels of vitamin A and carotene during gestation and at parturition is discussed. As the vitamin A levels fall at parturition, it is recommended that during pregnancy a diet rich in this vitamin should be supplied.—E. Eden.

Stallcup, O. T., & Herman, H. A. (1950.) *In vitro* **studies on the conversion of carotene to vitamin A in dairy calves.**—*J. Dairy Sci.* **33.** 237–242. [Authors' summary copied *verbatim.*] **2629**

Data obtained from the *in vitro* incubation of small intestine of dairy calves with a colloidal carotene solution indicate that the small intestine is a site of conversion of carotene to vitamin A. The incubation of minced liver tissue with a colloidal carotene solution resulted in a conversion of carotene to vitamin A. Conversion of carotene to vitamin A apparently is not a function of blood plasma.

Anon. (1949.) **Neurologic manifestations associated with vitamin A deficiency in young chicks.**—*Nutr. Rev.* **7.** 188–190. **2630**

This review deals mainly with the pathological studies of Fletcher & Rigdon [*Arch. Neurol. Psychiat.* (1949) **61.** 199] on Pekin ducklings maintained on a diet deficient in vitamin A, or on this diet supplemented with the vitamin, or on a commercial duck ration. Generalized muscular weakness was the first symptom of the deficiency, and appeared on the seventh or eighth day. Within 10–15 days incoordination and ataxia developed, and the birds were unable to stand unsupported. No apparent discrepancy between the volume of the brain and the cranial capacity was observed, but many tumour-like masses protruded, particularly in the cervical and lumbar regions, from the surface of the spinal cord, which was buckled and distorted. Hyaline cartilage and bone formation were noted in many of these masses. Gross haemorrhages and necrosis were present in the medullary substance. There were degenerative changes in the peripheral nervous system, but these were of minor importance as compared with the damage occurring in the spinal cord. It is concluded that while mechanical factors play a part in the pathogenesis of the nerve lesions, other factors as yet unidentified are also involved.

—E. M. Cruickshank.

Okey, R., Pencharz, R., & Leprovsky, S. (1950.) **Sex hormonal effects in incipient biotin deficiency.**—*Amer. J. Physiol.* **161.** 1–13. [Authors' summary slightly amended.] **2631**

A mild biotin deficiency was produced in rats by feeding an otherwise synthetic and adequate diet containing dried whole egg unsupplemented by biotin. The symptoms included (1) loss of hair without true dermatitis, (2) sensitivity to touch, (3) loss of subcutaneous and visceral fat,

(4) failure to store the excess liver lipid characteristic of rats fed the cholesterol-rich egg diet with a biotin supplement and (5) atretic changes in the ovary. Food intakes were well maintained on the unsupplemented diet, even after the deficiency became manifest. Biotin dosage increased the amount of food consumed by males to a greater extent than it did that consumed by females. Alopecia developed much more rapidly and became more nearly complete in intact males than in females. The typical skin damage involved breaking off of the hair rather than disappearance of hair follicles. Biotin dosage resulted in prompt regrowth of hair. Depletion of subcutaneous and visceral fat occurred in both sexes. It took place more rapidly in males than in females. Both sexes showed a characteristic inability to store excess liver lipid although the diet was high in cholesterol. Gonadectomy produced only slight changes in deficiency symptoms in males. In females on the unsupplemented diet, however, it resulted in increased food intakes, early weight gains, and a marked increase both in incidence and severity of biotin deficiency symptoms. Removal of the gonads did not, however, entirely eliminate the differences between males and females. Implantation of diethylstilboestrol pellets in castrate male rats fed the unsupplemented diet retarded growth, lowered food intakes and delayed or prevented deficiency symptoms to an even greater extent than was usual in intact females. On the other hand, the presence of testosterone propionate pellet implants hastened the development and increased the severity of biotin deficiency symptoms in intact and gonadectomized rats of both sexes. The possible relationships between the effects of the sex hormones on food intake and utilization and the need for biotin are discussed.

ANDERSON, G. C., & HOGAN, A. G. (1950.) **Requirement of the pig for vitamin B_{12}.**—*J. Nutrit.* **40.** 243–253. [Authors' summary copied *verbatim.*] **2632**

Young pigs were reared on a synthetic diet and given intramuscular injections of vitamin B_{12}. There was no definite response until the pigs were 6 weeks old. After that time they grew at an unusually rapid rate. One of the control pigs died. Another became emaciated and developed an abnormal appetite, followed by mild lesions of the skin. After the injection of 25 μg. of vitamin B_{12} she recovered rapidly. The third pig in this group developed no deficiency symptoms and grew at the normal rate.

The tentative estimate of the quantitative requirement for vitamin B_{12} when administered orally is 0·26 μg. daily per kilogram of live weight, or not over 1·5 μg. per 100 gm. of food. Two pigs supplied with fortified cow's milk grew more rapidly than did those that received the vitamin injections. It is suggested that an unrecognized vitamin is essential for the optimum nutritional state.

BLACK, D. J. G., GETTY, J., COATES, M. E., HARRISON, G. F., & KON, S. K. (1950.) **Hatchability of eggs and the production of chicks for the assay of vitamin B_{12}.**—*Biochem. J.* **46.** pp. viii–ix of Proceedings. **2633**

Light Sussex hens were depleted of their vitamin B_{12} stores by keeping them on an all-vegetable diet. After a month, the chicks hatched from the eggs of these hens had lower reserves of vitamin B_{12} than normal chicks as judged by their comparative growth rate on an all-vegetable diet. These reserves became less in successive hatches. A decrease from 80–30 % in hatchability during the first six months was also observed. These defects could be restored by supplementing the diet of the hens with 13 μg. vitamin B_{12} per lb. of food.
—E. EDEN.

HENRY, K. M., KON, S. K., & PORTER, J. W. G. (1950.) **Microbial digestion in the alimentary tract. Vitamin synthesis in relation to requirements.**—*Advanc. Sci.* **6.** 348–349. **2634**

In the ruminant considerable synthesis of the vitamin B and K complexes proceeds in the rumen, the contents of which subsequently enter the true digestive tract from which these vitamins can be utilized by the animal. In non-ruminants a similar synthesis proceeds in the large intestine. The products of such a synthesis can be little utilized by the host, the organisms being largely excreted intact as they are not subject to the digestive processes and the epithelial lining of the gut does not appear to be adapted to absorption of nutrients. Nevertheless, sulphonamides administered by mouth may so interfere with the intestinal flora as to cause vitamin deficiencies in certain circumstances. Non-ruminant animals fed diets rich in raw starch may be maintained on a vitamin-free diet. The process known as refection is dependent on the presence of starch-splitting organisms in the caecum. The end products of fermentation lowers the pH and this appears to promote growth of the micro-organisms, favours intestinal synthesis, and increases absorption.—J. H. HALE.

CAMPBELL, J., & TUBB, W. G. (1950.) **The stability of ascorbic acid in solution.**—*Canad. J. Res.* Sect. E. **28.** 19–32. [Authors' abstract copied *verbatim.*] **2635**

The stability of ascorbic acid in aqueous solution was increased under certain conditions by oxalic acid, metaphosphoric acid, glutathione,

thiourea, and sodium diethyldithiocarbamate. A slight protective effect was exerted by creatinine; but formic, phthalic, and orthophosphoric acids, creatine, and caffeine had no demonstrable effect. In all these instances the pH, concentrations of reagents, etc., must be considered. In oxalate and thiourea, maximum stability occurred at pH 2·5 to 3·0 and in glutathione at pH 3·6 to 4·2. The latter substance itself was also most stable at pH 3 to 4. At the optimum pH a concentration of 40 m*M* of oxalate gave maximal protection, this being independent of the initial concentration of ascorbic acid over the range 2 to 20 m*M*. Thus a stoichiometric relationship between the concentrations of the ascorbic acid and the oxalate required for protection was not found. A region of minimum solubility of oxalate in water occurred at pH 2·4 to 3·0, which coincides with the pH at which the maximum protective effect occurs and with the highest relative concentration of sodium hydrogen oxalate (or sodium hydrogen oxalate monohydrate). The absorption of ultraviolet light by ascorbic acid was altered by pH, the maximum shifting from 244 to 268 mμ from pH 2·8 to 4·5. The molecular extinction coefficient of ascorbic acid also changed with pH and was minimal at pH 4·0. This effect occurred in oxalate, which has a specific protective effect, and also in formate and orthophosphate, which have no specific effect. The possible mechanisms for the protection of ascorbic acid by oxalate are discussed.

SUNDE, M. L., CRAVENS, W. W., ELVEHJEM, C. A., & HALPIN, J. G. (1950.) **An unidentified factor required by chicks fed practical rations.**—*Poult. Sci.* **29.** 204–207. [Authors' summary copied *verbatim.*] **2636**

Eleven experiments have been conducted comparing vitamin B_{12} with fish solubles and liver products and in each case the chicks fed the fish solubles or liver have been larger at the end of the test period than those in the groups receiving crystalline B_{12} or the B_{12} concentrate. It is suggested, therefore, that chicks fed all vegetable rations require a factor or factors in addition to vitamin B_{12} and other known vitamins for maximum growth. The relation between the factor indicated from these data and other postulated unidentified factors cannot be determined at this time.

HOTCHKISS, R. D. (1950.) **The abnormal course of bacterial protein synthesis in the presence of penicillin.**—*J. exp. Med.* **91.** 351–364. **2637**

Penicillin appeared to exert no effect on oxygen uptake, phosphorus, or amino acid utilization of a washed suspension of staphylococci. Even using cells grown in the presence of penicillin, H. was not able to find any impairment of glutamic acid utilization as was reported by Gale and Taylor (1947), although it should be pointed out that they estimated the amino acid of the cell directly and by a manometric technique involving the use of specific amino acid decarboxylases. Cells in the presence of penicillin utilized amino acids of the culture fluid but failed to incorporate this material intracellularly, so that the protein nitrogen remained unchanged while an extracellular substance containing non-amino nitrogen in quantities approximately equal to the amino nitrogen utilized appeared in the culture. This non-amino fraction was thought to be a polypeptide.—J. H. HALE.

MCEWEN, A. D., & FOGGIE, A. (1950.) **Ketosis of dairy cows housed in courts and in byres.**—*Vet. Rec.* **62.** 271–273. [Authors' summary and conclusions copied *verbatim.*] **2638**

Clinical ketosis and sub-clinical ketosis are commoner in cows housed and tied or yoked in byres than in cows housed in courts with liberty of movement within the court. Ketosis is indicative of subnormal health, therefore any system of management that reduces the incidence of ketosis is favourable to the maintenance of bodily fitness and health. The court system of dairying reduces the incidence of ketosis and where existing facilities permit or where new buildings are to be constructed preference should be given to the court system.

CARTWRIGHT, G. E., TATTING, B., ASHENBRUCKER, H., & WINTROBE, M. M. (1949.) **Experimental production of a nutritional macrocytic anemia in swine.**—*Blood.* **4.** 301–323. **2639**

A syndrome with the morphological characters of human pernicious anaemia was produced in 32 pigs fed a diet deficient in folic acid. The purified diet contained casein, and was supplemented with seven vitamins of the B complex, sulphasuxidine, and a folic acid antagonist.

The haematological changes were a severe macrocytic anaemia, leucopenia due to a proportionately greater reduction in polymorphonuclear than in mononuclear cells, slight thrombocytopenia, and hyperplastic bone marrow with an increase in immature nucleated red cells resembling the megaloblasts of pernicious anaemia. These changes were not prevented or delayed by the administration of liver extract, but increasing the crude casein in the diet from 10 % to 15 % delayed the onset.

There was a rapid and clear-cut response to treatment with folic acid and related compounds. Purified liver extracts and vitamin B_{12} possessed some haematopoietic activity, but considerably less than the pteroylglutamic acid compounds. It is suggested that folic acid and a factor in liver extract

similar to or identical with vitamin B_{12} are required for normal haematopoiesis in the pig.
—A. G. SINGLETON.

BIGLAND, C. H. (1950.) **Ascites and oedema of brooded turkey poults in Alberta.**—*Canad. J. comp. Med.* **14.** 144–156. [French summary.] **2640**

Ascites and oedema in poults under 21 days of age appear to have been caused by an excessive intake of sodium salts in feed and water. The turkey food mixtures analysed had a higher sodium chloride content than was indicated by the manufacturers. Gravitation may greatly increase the salt content of residual feed in troughs. Water samples in some cases had high levels of sodium salts. Poults over the age noted tolerated doses toxic to younger birds. Losses were prevented by changing to water with a lower salt content, feeding milk, cleaning hoppers daily, or placing on a diet free from added salt. Sodium sulphamethazine aggravated the condition.—R. GWATKIN.

See also absts. **2698** (skin wounds in scorbutic g. pigs); **2743–44** (books, vitamins); **2749** (book, metabolic interrelations).

DISEASES, GENERAL

SIMPSON, R. E. H. (1948.) **The period of transmission in certain epidemic diseases. An observational method for its discovery.**—*Lancet.* **255.** 755–760. [Author's summary copied *verbatim.*] **2641**

A simple method of obtaining the date of infection in cases of some communicable diseases is provided by the serial interval and the incubation period. The method can be extended to discover the period of transmission and its vagaries by a study of the inherent variability of the serial interval. The importance of the measuring-point, and the principles guiding its wise selection are discussed and illustrated. The relationships determining epidemic pattern are analysed, and a demonstration is given of the use of model charts of ideal epidemics. The principles discussed are illustrated by the analysis of two small epidemics of measles.

MATTHEWS, W. B. (1950.) **A trial of β-naphthyldi-2-chloroethylamine (R48) in leukaemia, Hodgkin's disease, and allied diseases.**—*Lancet.* **258.** 896–899. [Author's summary copied *verbatim.*] **2642**

Seventeen patients were treated with β-naphthyldi-2-chloroethylamine (R48) by mouth, the usual dose being 300–400 mg. daily. Five cases of Hodgkin's disease all showed some improvement, but the results were on the whole disappointing. Two cases of reticulosarcoma and two of acute leukaemia did not respond. Three cases of chronic myeloid leukaemia were treated, with good remissions in two. Four cases of chronic lymphatic leukaemia were treated, with good remissions in two. One case of polycythaemia vera was still in remission a year after treatment.

Toxic symptoms included relatively mild and infrequent gastric disturbances, and cystitis in one patient. There was an invariable depression of the leucocyte-count and platelet-count. It was concluded that the action of R48 was essentially similar to that of nitrogen mustard (HN2) but slower and more easily controlled.

JOUSSELIN. (1949.) Notes sur la pathologie du dromadaire. De quelques traitements indigènes. **[Notes on diseases of the camel and on methods of treatment carried out by camel men.]**—*Rev. Elev. Méd. vét. Pays trop.* **3.** 105–108. **2643**

The paper contains no new information, but is of interest from an historical standpoint. During his service in Africa, J. noted the various diseases and ailments met with in the one-humped camel and the methods adopted in dealing with them by their native owners. Details are given of some methods of treatment used by these native empirics.
—D. S. RABAGLIATI.

ZHIKHAREV, A. A. (1947.) **[Infectious diseases in sheep and goats (Symposium).]**—*Veterinariya, Moscow.* **24.** No. 8. pp. 16–23. **2644**

This is a summary of the work in Russia of 11 authors on sheep diseases and of two authors on goat diseases. The sheep diseases comprise: enterotoxaemia (*Clostridium welchii*, *Cl. oedematiens*, and *Cl. fallax* infections); contagious agalactia; impetigo contagiosa (*Staphylococcus epidermidis*, *Staph. aureus*, and *Staph. albus* infections); malignant keratitis; endemic stomatitis (*Fusiformis necrophorus* infection); broncho-pneumonia and broncho-pleuro-pneumonia (causal agent unknown but suggested to be a Gram-negative bacterium).

The goat diseases dealt with are goat pox and caprine contagious pleuro-pneumonia.—F. A. A.

HOLMBOE, F. V. (1948.) Beror hudbetendelse hos storfe, "Huldrebrand" eller "Blaine" på en enterotoxaemi? **[Is blain in cattle connected with enterotoxaemia?]**—*Norsk VetTidsskr.* **60.** 28–29. **2645**

H. has previously described a disease of cattle living in the Stavanger area in Norway, known as "Blaine" or "Huldrebrand". All that is said here

about it is that the skin around the vulva and nose of affected cows is reddish-brown in colour. Until recently no fatal case had been seen, but not long ago an affected cow died and on P.M. examination was seen to have been affected by acute haemorrhagic enteritis, with haemorrhagic exudate in the abdominal cavity. Accordingly, H. suggests that an enterotoxaemia may have been related to the skin condition. [Clearly there are a number of theories which require investigation.]—J. E.

PARRY, H. B. (1949.) **Epileptic states in the dog, with special reference to canine-hysteria.**—*Vet. Rec.* **61.** 23–31. **2646**

P. discusses canine hysteria in considerable detail [see also Parry, H. B., *V.B.* **19.** 167]. He deals with the nature of the nervous dysfunction and the alterations in the rhythmic electrical activity of the brain as recorded by the electroencephalograph, these dysrhythmias appearing before clinical signs. Epileptic episodes occur only when various circumstances summate to exacerbate the dysrhythmia to a level such that a brain seizure of some kind occurs. Factors influencing the "brain seizure level" are discussed and are set out schematically in a diagram indicating the varying types of clinical disorder which may ensue.

Under three headings: (*a*) factors affecting the brain's response, (*b*) factors affecting the nature of the afferent stimulus, and (*c*) systemic metabolic factors, data are considered. P. then discusses in detail the clinical manifestation of the "brain seizure level" including syndromes involving epileptic states. Finally, he discusses the differential diagnosis of the epileptic syndrome in the dog.

He concludes that since canine hysteria can be produced under experimental conditions, knowing that no other complicating factors are present, the clinical and pathological features may be defined with some accuracy, and with this information as a measure the clinical differentiation of other naturally occurring syndromes may be attempted and in due course the conditions necessary for their experimental production may be defined.

—E. J. H. FORD.

WEIPERS, W. L. (1949.) **Clinical aspects of diseases of the alimentary tract of the cat.**—*Vet. Rec.* **61.** 671–678. Discussion pp. 678–682. **2647**

The conditions were dealt with on a regional basis, with the stress on pathognomonic symptoms and differential diagnosis. (1) The so-called "rodent ulcer" of the lip, an inflammatory granuloma which may possibly be infectious, and is satisfactorily treated by gentian violet as described by Patchett [E. H. (1944) *Vet. Rec.* **56.** 14]. (2) Buccal lesions resulting from wounds, foreign bodies, accumulations of tartar in old cats; dental fistula, parodontal disease. Ranula—in most of W.'s cases, the main Wharton's duct was intact, and the ranula was a retention cyst of small mucous glands. (3) Foreign bodies in the throat. (4) Carcinoma of the oesophagus; relatively common in the cat, this being responsible for most cases of oesophageal obstruction. (5) Hair-balls; cats normally vomit up pellets of fur, or pass them in the faeces; the condition becomes pathological only when the fur is retained in the stomach. Recovery follows reasonably early operative removal. (6) Stenosis of pylorus; this is a comparatively rare condition, treated once (and probably twice) successfully by a modified Rammstedt's operation. The condition occurs at 3–4 years of age, and diagnosis can be confirmed by X-ray after barium meal, which may take several hours, as opposed to the normal 5 min., to enter the duodenum. (7) Infectious diseases: ulcerative glossitis, infectious enteritis, cat distemper. (8) Parasites. (9) Alimentary tuberculosis. This has become very rare in W.'s practice. (10) Impaction of the colon. (11) Diarrhoea in young kittens. This occurs at 2–4 months of age; there is no evidence of coccidiosis or mass infestation with worms. (12) Diarrhoea in older cats, frequently caused by colitis. (13) A syndrome believed to be associated with liver malfunction: chronic illness, gradual loss of weight, poor appetite, and in some cases enlargement of the liver. The cat becomes hollow-eyed, gaunt, and sometimes develops ascites. (14) Intussusception, and prolapse of bowel; this is less common in the cat than in the dog.

In a final section, W. summarized the signs, syndromes, and histories usually associated with diseases of the alimentary tract. There was a lengthy discussion at the meeting at which the paper was presented.—E. COTCHIN.

GOFMAN, J. W., LINDGREN, F., ELLIOTT, H., MANTZ, W., HEWITT, J., STRISOWER, B., HERRING, V., & LYON, T. P. (1950.) **The role of lipids and lipoproteins in atherosclerosis.**—*Science.* **111.** 166–171 & 186. **2648**

Examination of normal rabbit sera with the ultra-centrifuge revealed a lipoprotein component (of flotation rate between 5–8 Svedberg units under given specified conditions) containing 30 % cholesterol. After cholesterol feeding some of the rabbits had new components (Sf 10–30) and a higher incidence of gross atherosclerosis on P.M. examination than the controls. Human sera revealed similar components, classes having Sf 3–8 and 10–20. Whereas all sera had the former, only some had the latter, and the incidence of this can be correlated with the known incidence of atherosclerosis. Of 104 patients with an established myocardial infarction 100 had the Sf 10–20

component. It is suggested that conflicting reports in the literature on the importance of cholesterol levels in the development of atherosclerosis may be explained by the finding in human beings that subjects with high blood cholesterol levels have a higher incidence of Sf 10–20 fractions, but the two conditions may vary quite independently. A similar finding is reported for the cholesterol-fed rabbits.—P. H. HERBERT.

DUGUID, J. B. (1949.) **Pathogenesis of atherosclerosis.**—*Lancet.* **257.** 925–927. **2649**

Atherosclerosis is not always caused by a fibrous overgrowth of the blood-vessels. The role of thrombus formation in this disease is discussed. Work on experimental animals indicated that retracted thrombi may become covered with endothelium and present a picture similar to that found in atherosclerosis.—E. EDEN.

See also absts. **2699** (purpura haemorrhagica in horses); **2708** (reproductive diseases, cattle); **2720** (congenital goitre in calves); **2722–3** ("daft lambs"); **2742** (report, Brit. Guiana).

POISONS AND POISONING

MCENTEE, K. (1950.) **Mercurial poisoning in swine.**—*Cornell Vet.* **40.** 143–147. [Author's summary copied *verbatim.*] **2650**

Mercurial poisoning is reported in two herds of swine due to prolonged ingestion of seed oats treated with mercurial fungicide.

The main symptoms included possible glossopharyngeal paralysis, blindness, normal to subnormal temperature, and locomotor disturbances followed by recumbency and death in a few days.

There were no characteristic gross post-mortem lesions. The microscopic lesions included coagulation necrosis of convoluted tubules of the kidney and necrosis of neurons in the brain.

HARTWIGK, H. (1950.) Lähmungen bei Hühnern durch Weichigelit. [**Paralysis of fowls as a result of synthetic rubber poisoning.**]—*Mh. Vet.-med.* **5.** 53–55. **2651**

In Saxony a condition in fowls comprising paralysis of the legs and diarrhoea was observed. It was found that the cause was intoxication with orthotricresyl phosphate, a substance used for softening in synthetic rubber manufacture. There are several factories in the district producing a rubber substitute for making shoe soles. Over a period of two years the condition was observed in 18 flocks, 12 of which were owned by shoemakers. Waste synthetic rubber shavings and chips had been thrown on refuse dumps and manure heaps to which the poultry had access.

The clinical picture was loss of appetite, progressive paralysis of the legs accompanied by a foetid diarrhoea. The fowls remained sensitive to pain. All birds died within 3–4 weeks. P.M. there was atrophy of the liver, the intestines, kidneys, and ovaries. The gall bladder was always full. There was inflammation of the intestinal mucosa. Pieces of rubber substitute were found in the stomach of some fowls. Histologically there was toxic degeneration of the myelin sheath of the peripheral nerves of the lumbo-sacral plexus and of the sciatic nerves. These manifestations were similar to those of vitamin B_1 deficiency.

Two cocks five months old were each given 5 g. of synthetic rubber shavings and within two weeks they developed symptoms similar to those observed in natural cases.—E. G.

MCGAUGHEY, C. A. (1950.) **Codiaeum variegatum (Croton) poisoning in a goat.**—*Vet. Med.* 45. 134–135. **2652**

A male goat, about five years of age, after ingesting croton bushes, *Codiaeum variegatum* (Euphorbiaceae), had severe abdominal pain and distention of the rumen. The animal recovered after treatment with demulcents and laxatives, and was apparently healthy for four months. A second time on gaining access to the croton bushes, illness followed with blood-stained faeces and death in spite of treatment. On P.M. examination patchy congestion was present in the lungs. The kidneys, the wall of the bladder, and parts of the intestine were inflamed. Several calculi, mainly composed of phosphates, were found in the urinary system. Tests of these calculi for oxalates, urates, uric-acid, carbonates, cystine, and xanthine were negative.

—E. EDEN.

MCNELLIS, R. (1949.) **Rattlesnake bite.**—*J. Amer. vet. med. Ass.* **114.** 145–146. **2653**

The author records the appearance of pronounced swellings about the nostrils, upper lip, and throat in four young stallions brought from night pasture. On examination the typical fang marks of a rattlesnake were found. The illness in one horse is described.

When first seen about 8 a.m. the patient appeared alert and attempted to eat in spite of the oedematous lip. The pulse was rapid, ranging from 75–80. There was considerable haemorrhage from the nostrils which lasted for two hours. The mucous membrane on the under side of the upper lip was hyperaemic and within a few hours turned a glistening light purple. As soon as discovered, antivenin [dose not stated] was administered intramuscularly to each animal bitten.

In the case of which details are given, the oedema

of the throat and nose had increased so much by 11.30 a.m. that the nasal passages were closed and there was distressed respirations; tracheotomy was performed. By the afternoon of the next day the oedema was reduced but the nasal passages were still closed; by the third day the horse was able to breathe through the nostrils and it soon recovered.

—H. PAVER.

See also absts. **2745–46** (books, toxicology).

PHARMACOLOGY AND GENERAL THERAPEUTICS

(For treatment of specific infections see under the appropriate disease)

KOBYAKOVA, N. I. (1947.) **[Sugar-beet leaf extract in veterinary work.]**—*Veterinariya, Moscow.* **24.** No. 8. p. 34. **2654**

It is stated that an infusion of sugar-beet leaves, either injected subcutaneously or used as a dressing, is of value in such affections as mastitis, metritis, and other purulent conditions.—F. A. A.

EVELETH, D. F., HOLM, G. C., & BOLIN, F. M. (1950.) **The use of hyaluronidase with calcium gluconate medication in sheep.**—*Vet. Med.* **45.** 225–227. [Authors' summary copied *verbatim.*] **2655**

The injection of a glucose-calcium gluconate solution containing hyaluronidase intramuscularly and subcutaneously into sheep was followed by rapid absorption. These findings are of such a nature it is suggested that this method of therapy may be employed in any cases of ketosis or hypocalcemia of sheep, cattle, or other species.

SCHMIDT, H. (1950.) **An advance in the therapeutics of pentavalent antimony: Solustibosan (sodium antimony gluconate).**—*J. trop. Med. (Hyg.).* **53.** 95–102. [Author's summary copied *verbatim.*] **2656**

A survey is given of the chemistry, testing in experimental leishmaniasis and pharmacological data of Solustibosan (sodium antimony gluconate) and of clinical experiences with the product in kala-azar and oriental sore. This complex salt of antimonic acid seems to be superior in many respects to the organic pentavalent antimony compounds hitherto used. Experiences in filariasis and other diseases are cited.

DOUGHTY, A. G. (1950.) **Flaxedil in laryngeal intubation.**—*Lancet.* **258.** 899–902. [Author's summary copied *verbatim.*] **2657**

The use of flaxedil (tri-(β-diethylamino-ethoxy)-benzene triethiodide) in facilitating laryngeal intubation is described. Its effect for this purpose is compared with that of decamethonium iodide. The advantages of the use of curarising agents in facilitating intubation are discussed in comparison with other methods.

MACMILLAN, R. L. (1948.) **Observation on the mechanism of action of dicoumarol.**—*Science.* **108.** 416–417. **2658**

When normal plasma is added to dicoumarol plasma, the prothrombin content of the mixture is increased to a greater degree than can be observed by a simple mixing of prothrombin solutions of varying concentration. This is explainable by the presence of a prothrombin accelerator in normal plasma which is absent in dicoumarol plasma.

—MALCOLM WOODBINE.

KUPFERBERG, A. B., STYLES, H., SINGHER, H. O., & WAKSMAN, S. A. (1950.) **The production of streptocin by different strains of** *Streptomyces griseus.*—*J. Bact.* **59.** 523–526. [Authors' summary copied *verbatim.*] **2659**

Streptocin has been found to be produced by three different strains of *Streptomyces griseus.* The original streptocin-producing strain 3533 and the grisein-producing strain yielded comparable amounts of streptocin. The streptomycin-producing strain of *S. griseus* (3496) gave a much lower yield than the other strains tested. The highest concentration of streptocin was obtained from the pellicle of *S. griseus* 3533.

When *S. griseus* 3533, the streptocin-producing strain, is grown on the medium of Whiffen *et al.* (1946), it produces actidione. When grown on the streptocin medium, however, it fails to give any antifungal activity. When this organism is grown on either medium, it produces a substance highly active against gram-positive bacteria, notably *Sarcina lutea.*

DOLL, E. R., & WALLACE, M. E. (1948.) **Dosage and serum level of streptomycin in horses.**—*Vet. Med.* **43.** 410–413. **2660**

In young foals and yearlings, intramuscular injection in the neck at 3-hourly intervals of doses of 0·5 mg. per lb. body weight gave serum concentrations of 1–2 units per ml. after three injections. This dose in adult horses gave 2–4 units per ml. Generally, doses of 1 mg. per lb. gave serum levels of 2–4 units per ml. in foals and 4–8 in yearlings and adults. Doses of 2 mg. per lb. gave levels of 4–32 units per ml., and doses of 4 mg. per lb. gave 8–32 units per ml. serum.

—MALCOLM WOODBINE.

KRISHNAMURTHY, V. N. (1950.) **Effects of penicillin and streptomycin on vaccine lymph (calf lymph). [Correspondence.]**—*Nature, Lond.* **165.** 451–452. **2661**

It is claimed that parenteral administration of streptomycin and penicillin to a calf inoculated for

the production of smallpox lymph together with the external application of streptomycin over the vaccinated area reduces the bacterial contamination of the vaccine lymph to be obtained much more efficiently than any other method.—E. EDEN.

HITCHNER, S. B. (1949.) **Streptomycin as a treatment for infectious sinusitis of turkeys.** —*Poult. Sci.* **28.** 672–629. **2662**

Limited trials indicated that streptomycin injections were effective in the treatment of infectious sinusitis of turkeys. The drug has a specific inhibitory action on the infective agent. Penicillin treatment was ineffective.—E. EDEN.

PRIER, J. E. (1950.) **The *in vivo* and *in vitro* effect of aureomycin upon *Pasteurella multocida*.**—*Vet. Med.* **45.** 243–245. [Author's summary copied *verbatim*.] **2663**

Aureomycin inhibits *P. multocida in vitro* in concentrations less than either penicillin or streptomycin. Chick embryos infected with *P. multocida* were protected in part by treatment with 250 to 2,500 gamma of aureomycin. The survival rate of chicks experimentally infected with *P. multocida* and treated parenterally with 1·5 to 50 mg. of aureomycin per lb. body weight was 50 to 80 % higher than that of untreated controls. Mixing 250 to 500 mg. aureomycin/kg. in the feed increased the survival rate from 15 to 30 % over untreated controls.

GRUHZIT, O. M., FISKEN, R. A., REUTNER, T. F., & MARTINO, E. (1949.) **Chloramphenicol (chloromycetin), an antibiotic. Pharmacological and pathological studies in animals.** —*J. clin. Invest.* **28.** 943–952. **2664**

The paper records detailed pharmacological studies of chloramphenicol, originally isolated from *Streptomyces venezuelae* and subsequently synthesized as pure D(-)*threo*-1-*p*-nitrophenyl-2-dichloroacetamido-1,3-propanediol, on mice, rats, g. pigs, dogs, and rabbits. It is a neutral, white, crystalline substance of bitter taste, stable in acid or neutral solution and soluble in water at about 0·25 % at 20° C.

The compound is absorbed after parenteral or oral administration and appears in the blood serum, urine, bile, and cerebrospinal fluid within two hours. It disappears rapidly—within 4–6 hours from the blood after intravenous dosage and 12–16 hours after oral dosage. It is non-toxic and has no cumulative effects, for example, on an oral dosage of 100–200 mg. per kg. per day to dogs over four months. Intravenous doses of 12·5–50 mg. per kg. are well tolerated.—MALCOLM WOODBINE.

TOWN, B. W., WILLS, E. D., & WORMALL, A. (1949.) **Action of suramin on enzymes.**—*Nature, Lond.* **163.** 735–736. **2665**

A preliminary report of work designed to find what enzyme systems may be responsible for the effect of suramin on trypanosomes. Urease was found to be strongly inhibited at pH 5 and trypsin to be rather more sensitive than has been reported previously. Glucose fermentation by yeast juice is completely inhibited by concentrations greater than $2{\cdot}0 \times 10^{-5}$ M.—P. H. HERBERT.

HARPUR, R. P., SWALES, W. E., & DENSTEDT, O. F. (1950.) **The fate of phenothiazine in the gastrointestinal tract of the sheep.**—*Canad. J. Res.* Sect. D. **28.** 143–161. [Authors' abst. copied *verbatim*.] **2666**

The methods for estimating phenothiazine and phenothiazone in biological materials have been investigated. It has been shown that when phenothiazine, or phenothiazone, is treated with bromine (under the conditions described), a red color is produced which has absorption maxima at the following wave lengths: 240, 282, 291, 375, and 510 mμ. Phenothiazone, in 95 % ethanol, has a spectrum with absorption maxima at 237, 273, 280, 288, 369, and 508 mμ. Thus the bromine method is not applicable for distinguishing between these two compounds. It is shown also that phenothiazine may interfere with the estimation of phenothiazone when the latter is measured by the light absorption of its free radical. The ultraviolet absorption spectra of phenothiazine and diphenylamine *o*-sulphoxide have been determined. The spectrum of the former compound has a maximum at 254 mμ (with a small maximum at 318 mμ), and that of the latter has maxima at 227, 272, 302, and 335 mμ. Leucophenothiazone also has a maximum at 254 mμ.

While excretion studies on sheep confirm that 40 % of the orally administered phenothiazine is lost in the urine, it is shown that the absorption of the drug from the intestine is not dependent upon oxidation to phenothiazone in the rumen. Indeed, the drug appears to be unchanged in this organ. In a post-mortem examination of the gastrointestinal tract no phenothiazone was found proximal to the bile duct. It is suggested that phenothiazine is absorbed from the rumen unoxidized. In support of this it is confirmed that some phenothiazine may be recovered unchanged from the urine of the sheep.

HARPUR, R. P., DENSTEDT, O. F., & SWALES, W. E. (1950.) **Absorption of phenothiazine from the rumen of sheep, and its estimation in blood serum.**—*Canad. J. Res.* Sect. D. **28.** 162–172. [Authors' abst. copied *verbatim*.] **2667**

Under the conditions described, phenothiazine is shown to be soluble in human and sheep serum. Ultraviolet examination of serum containing phenothiazine indicates that the compound is unchanged by solution in serum. After preliminary

experiments with ultraviolet analysis the visual spectra of the free radicals were found to be more suitable for the analysis of sheep serum. A method is described, which makes use of free-radical absorption spectra, for the detection and approximate estimation of phenothiazine in serum when it is present with phenothiazone. The method also allows for the detection of diphenylamine *o*-sulphoxide. Experiments with lambs which had been dosed with phenothiazine showed that while the peripheral circulation contained leuco-phenothiazone, the blood draining the rumen contained phenothiazine also.

RAWSON, G. W. (1949.) **Allergy and antihistamine therapy in veterinary practice.**—*Vet. Med.* **44.** 489–493. **2668**

The effect of histamine is animals and its possible relation to allergy were discussed. Antihistamine drugs such as pyribenzamine seemed to be successful in the treatment of some cases of sensitization. Recommended dosage levels and mode of administration for various species are given.—E. EDEN.

MOYNAHAN, E. J., & WATSON, D. (1949.) **Failure of antihistamine drugs to inhibit hyaluronidase *in vitro*. [Correspondence.]**—*Nature, Lond.* **163.** 173. **2669**

None of the antihistamine drugs investigated (antistin, benadryl, pyranisamine, and pyribenzamine) depressed the spreading effect of hyaluronidase when tested *in vitro*. Since histamine enhances the spreading *in vivo*, the effects of the antihistamine drugs as reported in the literature may be due to their antagonism to histamine rather than to a direct action on hyaluronidase.—E. EDEN.

BOURNE, G. (1949.) **Antipyretic action of cryogenine.**—*Lancet.* **257.** 1126–1128. **2670**

Cryogenine (phenylsemicarbazide) is recommended as an antipyretic. As its effect often continues after administration has ceased, B. suggested that it acts on the heat regulating centre.—E. EDEN.

KROHN, P. L., & ZUCKERMAN, S. (1950.) **The effect of androgen and oestrogen on the testes of immature monkeys.**—*J. Endocrinol.* **6.** 256–260. **2671**

The seminiferous tubules of immature male monkeys enlarged after injections of testosterone propionate; the rate of mitosis in the spermatogonia also increased. Oestrogen administration for long periods (14–62 days) had the reverse effect. These hormones probably act directly on the testis and not through the stimulation of the pituitary gland. —E. EDEN.

ANON. (1949.) **Cortisone in rheumatoid arthritis.**—*Brit. med. J.* 5 Nov. 1040–1041. **2672**

The findings of American workers on the effect of cortisone and adrenocorticotrophic hormone (ACTH) on rheumatoid arthritis are discussed. Although relapse usually occurs when the administration of these preparations ceases, so far they are the most effective agents in treating this disease. The use of ACTH in Great Britain is also summarized. The doses of ACTH required are higher than the quantities produced physiologically in the body. As the preparations are in short supply, those used in Great Britain were often of low potency. Some of the results were therefore not as satisfactory as those obtained in the U.S.A. —E. EDEN.

BERTHRONG, M., RICH, A. R., & GRIFFITH, P. C. (1950.) **A study of the effect of adrenocorticotropic hormone (acth) upon the experimental cardiovascular lesions produced by anaphylactic hypersensitivity.**—*Johns Hopk. Hosp. Bull.* **86.** 131–140. [Authors' summary copied *verbatim*.] **2673**

Forty rabbits were sensitized with horse serum in the manner known to favor the development of periarteritis nodosa and cardiac inflammatory lesions. Half were treated with pituitary adrenocorticotropic hormone (ACTH), the remainder serving as controls. Well-marked vascular or cardiac lesions or both were found in 18 of the 20 untreated controls, whereas such lesions were found in only 5 of the 20 animals treated with ACTH.

While these results strongly suggest that ACTH exerts an inhibitory effect upon the development of the cardiovascular lesions of hypersensitivity, further studies are required before such a conclusion can be regarded as established.

TURNER, C. W., & KUMARAN, J. D. S. (1949.) **Gonadotrophic hormone stimulating properties of pyrimidine sulphonamide derivatives.**—*Poult. Sci.* **28.** 855–861. [Authors' summary slightly modified.] **2674**

The feeding of two sulphonamide derivatives (sulfamerazine and sulfamethazine) at levels of 0·1 and 0·2 % of the starter ration stimulated the growth of the combs of White Plymouth Rock cockerels up to 12 weeks of age. Examination of the testes indicated stimulation of the stage of spermatogenesis as well as of the interstitial cells of Leydig.

The authors' observations are believed to indicate that these compounds possess the ability to stimulate directly or indirectly the anterior pituitary to secrete increased amounts of the two gonadotrophic hormones, FSH (follicle-stimulating hormone) and LH (luteinizing hormone) or ICSH (interstitial cell-stimulating hormone).

The biological activity of several sulphonamides of related structure is reported.

HARMER, G. L. M., & BROOM, W. A. (1948.) **Activity of some synthetic oestrogens determined by experiments on rats.**—*Lancet.* **255.** 766–767. [Authors' summary copied *verbatim.*] **2675**

Large-scale experiments designed to assess the oestrogenic activity of some synthetic oestrogens have been made with ovariectomised adult female rats.

Hexoestrol given by mouth has only a tenth of the activity of stilboestrol, dienoestrol two-thirds, and potassium hexoestrol sulphate a fourteenth. Potassium hexoestrol sulphate was given in aqueous solution; the others were dissolved in arachis oil.

Injected subcutaneously in aqueous solution hexoestrol has about two-thirds, dienoestrol less than a third, and potassium hexoestrol sulphate a hundredth of the activity of stilboestrol. Oestrone has about the same activity as dienoestrol.

JEFFCOATE, T. N. A., LISTER, U. M., HARGREAVES, B., & ROBERTS, H. (1948.) **Ethinyl oestradiol.** *Brit. med. J.* 6 Nov. pp. 809–812. **2676**

Ethinyl oestradiol was about 50 times more active than stilboestrol in suppressing lactation. Its other oestrogenic effects are described and workers are warned against overdosage.—E. EDEN.

BLANCHARD, K. C., DEARBORN, E. H., MAREN, T. H., & MARSHALL, E. K., JR. (1950.) **Stimulation of the anterior pituitary by certain cinchoninic acid derivatives.**—*Johns. Hopk. Hosp. Bull.* **86.** 83–88. [Authors' summary copied *verbatim.*] **2677**

A number of cinchoninic acid derivatives, salicylic acid and aminopyrine have been found to decrease the adrenal ascorbic acid of rats. The anterior pituitary gland has been shown to be an essential mediator of this effect.

SELYE, H. (1950.) **Production of hypertension and hyalinosis by desoxocortisone.**—*Brit. med. J.* 28th Jan. pp. 203–206. **2678**

Rats were castrated and unilaterally nephrectomized. They were fed on "purina dog chow" and were given a 1 % solution of sodium chloride as their drinking fluid. Five rats in addition were injected subcutaneously every day with 2·5 mg. of desoxocortisone acetate. The lesions produced by the injection of this mineralo-cortoid (a compound affecting salt and water metabolism) of the adrenal cortex were similar (hypertension and histological lesions of hyalinosis) to those seen after overdosage with desoxycorticosterone. There were no changes in the adrenal glands and no androgenic effects were noted.—E. EDEN.

PALJUCH, M. (1950.) Schilddrüsenveränderungen nach Methylthiouracileinwirkung bei weissen Mäusen. **[Influence of methylthiouracil on the thyroid gland of white mice.]**—*Wien. tierärztl. Mschr.* **37.** 233–245. **2679**

Subcutaneous injections of methylthiouracil at the rate of 500–600 mg. per kg. were given daily to mice for six weeks. On P.M. examination the thyroid weights were ten times that of a normal animal. Histological examinations indicated that besides hypertrophy degenerative changes had also taken place.—E. EDEN.

See also absts. **2481** (penicillin-streptomycin bougies in mastitis); **2490–92** (penicillin in swine erysipelas); **2497** (streptomycin in joint-ill); **2503** (pullorum disease); **2507** (foot rot in cattle); **2514** (*T. congolense* infection); **2519–21** (blackhead); **2523** (avian coccidiosis); **2526–27** (anaplasmosis); **2546** (BAL); **2565** (piglet influenza); **2591, 2593–96** (parasiticides); **2600, 2603–4** and **2606** (anthelmintics); **2704** (chemotherapy); **2735** (sterilizing agent for bacteriological media); **2731** (anaesthesia in zoo animals); **2741** (report, New Zealand); **2746–47** (books, pharmacology).

PHYSIOLOGY, ANATOMY, AND BIOCHEMISTRY

VALLEE, B. L., & ALTSCHULE, M. D. (1949.) **Zinc in the mammalian organism, with particular reference to carbonic anhydrase.**—*Physiol. Rev.* **29.** 370–388. **2680**

The literature on the absorption, excretion, and distribution of zinc in the body is summarized. Experimental production of zinc deficiency in mice and rats is described. Although 2 mg. of zinc-gluconate per kg. body weight were tolerated well by dogs, 4 mg. produced lassitude, decreased tendon reflexes, diarrhoea, and paresis of the hind legs; the electrocardiographic changes were similar to those observed in potassium intoxication. Cats fed large doses of zinc developed fibrosis of the pancreas. In rats given 0·5 % zinc carbonate daily there was impaired production of erythrocytes.

The claim that zinc is carcinogenic has not been confirmed. A substantial part of the review is taken up by the discussion of zinc complexes and enzymes.—E. EDEN.

STREICHER, E., HACKEL, D. B., & FLEISCHMANN, W. (1950.) **Effects of extreme cold on the fasting pigeon with a note on the survival of fasting ducks at −40° C.**—*Amer. J. Physiol.* **161.** 300–306. [Authors' summary copied *verbatim.*] **2681**

Fasting pigeons were able to survive from 48 to 144 hours at −40° C. During this time, the metabolic rate of the birds was increased to approximately fourfold its normal resting value at room temperature, and this high level was maintained until the terminal drop in body temperature. There was no significant difference between the blood glucose values of fasting pigeons kept in the cold chamber for 1, 3, 8, 24 48, and 72 hours, and

the values for control birds fasted at room temperature for the same length of time. There was a significant decrease in the liver glycogen content of fasting birds after 8 hours in the cold chamber. Birds which were fasted at room temperature did not show a comparable decrease until 24 hours after food was last taken. Pigeons exposed to a 3 m.p.h. wind succumbed more quickly at —40° C. than birds protected from the wind. However, the percentage weight loss after 48 hours was the same in both groups of animals. This suggests that the increment in the metabolic rate of the pigeons is already maximal at —40° C. with no wind present.

Four fasting ducks survived from 7 to over 16 days at —40° C.

Plucked pigeons showed an immediate drop in body temperature after being placed in the cold chamber at —40° C., and died within 20 to 30 minutes. It was concluded that the insulation afforded by the feathers is essential to the survival of the pigeons at —40° C.

PIPES, G. W., & TURNER, C. W. (1948.) **The retention of goitrogens in the blood and tissues of several domestic animals.**—*Res. Bull. Miss. agric. Exp. Sta.* No. 422. pp. 3–36. **2682**

After discussing the chemical structure, mode of action, and assay of goitrogenic compounds the authors described experiments on fowls, goats, sheep, pigs, rabbits, and rats in a study on absorption and distribution in the blood and tissues of orally administered goitrogens and the possibility of goitrogenic activity in the meat from animals treated in this way. Thiouracil was rapidly absorbed and eliminated from the blood in fowls, sheep, and goats, no trace being detectable in fowls 24 hours after feeding concentrations of up to 0·6 % of the ration. If a ration containing the goitrogen was fed *ad libitum*, a high blood concentration was maintained, but the level fell during the night. In oesophagus-ligated fowls thiouracil was not absorbed from the crop. Thiobarbital produced higher blood levels than thiouracil in the fowl and goat.

Tissues of fowls or pigs adulterated with 5–25 % thiouracil fed to rats caused increased thyroid weights; but a diet containing 95 % meat from birds which were fed at a level of up to 1 % thiouracil in the ration, or from rabbits fed thiouracil or thiobarbital at levels of up to 0·4 %, of from pigs given 0·05 % thiouracil in their ration produced barely perceptible goitrogenic effects, and tissues from sheep, goats, and calves given 4 g. thiouracil daily produced no increase in thyroid size.

Biological assays indicated that thiouracil is not retained in muscular tissues in excess of 5 mg. per 100 g. The authors conclude from all available evidence that no hazard is involved in the human consumption of meat from thiouracil fattened livestock.—B. A. CROSS.

CAMPBELL, R. M., & KOSTERLITZ, H. W. (1950.) **The effects of growth and sex on the composition of the liver cells of the rat.**—*J. Endocrinol.* **6.** 308–318. **2683**

As the amount of nuclear desoxyribonucleic acid (DNA) present in the liver is not affected by variations in dietary protein, it was used as a reference standard of liver growth. Up to puberty, the increase of this compound was the same in both sexes, then it became more rapid in the females, but this latter effect could be reversed by castration. In females, cytoplasm increased at the same rate as the nuclear material, in males relatively more cytoplasm was formed; this was attributed to the anabolic effect of androgen on proteins. Increased protein in the diet also increased the cytoplasmic content of the male livers. These results indicate that in males the liver contains more labile cytoplasm, but no major differences were found between the sexes in its composition.

—E. EDEN.

I. MCNAUGHT, M. L., SMITH, J. A. B., HENRY, K. M., & KON, S. K. (1950.) **The utilization of non-protein nitrogen in the bovine rumen. 5. The isolation and nutritive value of a preparation of dried rumen bacteria.**—*Biochem. J.* **46.** 32–36. **2684**

II. MCNAUGHT, M. L., OWEN, E. C., & SMITH, J. A. B. (1950.) **The utilization of non-protein nitrogen in the bovine rumen. 6. The effect of metals on the activity of the rumen bacteria.**—*Ibid.* 36–43. **2685**

I. In the first of these studies the preparation of large quantities of bacteria from rumen liquid was described. The material had a protein content of 44 % and an ash content of 7·1 %. Biological value and true digestibility were found to be 88·3 and 73·2 with young female rats as the test animals.

II. The effect of metallic salts on rumen bacterial growth was studied. By comparing the non-protein nitrogen disappearing from strained rumen liquid with the rate of disappearance when known concentrations of salts are present, the tolerance and inhibition concentrations were defined. These were 100 and 1,000 p.p.m. of iron, 10 and 25 p.p.m. of copper, 100–1,000 and 2,000 p.p.m. of molybdenum, <10 and 1,000 p.p.m. cobalt. With just sufficient *o*-phenanthroline to cause complete inhibition, growth was completely restored by adding 1–2 p.p.m. of iron. It was noted that the amount of iron found in association with the bacteria increased during incubation.—P. H. HERBERT.

BARRNETT, R. J. (1950.) **Experimental production of cretin-like rats.**—*Yale J. Biol. Med.* **22.** 313–322. [Author's summary copied *verbatim.*] **2686**

Experimental cretinism was produced by feeding thiouracil to pregnant female rats. Thiouracil crossed the placental and mammary barriers. Growth and early development of the offspring were retarded. The thyroid glands of the newborn treated animals showed the hyperplastic effect of thiouracil. The effect of thiouracil on the thyroid gland was a quantitative one; the degree of thyroid inhibition was directly related to the dosage of drug used.

NACHMAN, H. M., JAMES, G. W., MOORE, J. W., & EVANS, E. I. (1950.) **A comparative study of red cell volumes in human subjects with radioactive phosphorus tagged red cells and T-1824 dye.**—*J. clin. Invest.* **29.** 258–264. [Authors' summary copied *verbatim.*] **2687**

A comparative study of the red cell and plasma volumes of 38 surgical patients as measured by P^{32} tagged red cells and T-1824 plasma dye is presented. On the average, the red cell volume as measured with P^{32} tagged red cells is 20·0 % less than the value obtained with T-1824 plasma dye. This discrepancy is probably due to the difference in the hematocrit of blood in peripheral veins and blood in other vessels of the body and to the intrinsic error of the centrifuge hematocrit. The body hematocrit on the average is 12·0 % less than the average venous hematocrit. The hematocrit value enters into the calculation of the red cell volume by the isotope dilution technique and probably results in slight overestimation of the red cell volume. Statistically, results of the present study do not differ significantly from similar studies using radioiron tagged red cells. The advantages of the P^{32} method over the radioiron method are outlined.

COWIE, A. T., & STEWART, J. (1949.) **Adrenalectomy in the goat and its effects on the chemical constituents of the blood.**—*J. Endocrinol.* **6.** 197–204. **2688**

A method for adrenalectomy in goats is described. None of the 19 goats operated on survived for longer than 18 days. Seven died within two days of the operation; operative shock may have been responsible for these deaths. Large increases were observed in the blood levels of non-protein nitrogen, phosphates, and potassium; haemoglobin, sugar, and calcium levels remained normal, but there was a fall in sodium and chloride.

—E. EDEN.

WRIGHT, H. P., OSBORN, S. B., & EDMONDS, D. G. (1948.) **Rate of flow of venous blood in the legs measured with radioactive sodium.**—*Lancet.* **255.** 767–769. [Authors' summary copied *verbatim.*] **2689**

A direct method of measuring the rate of venous blood-flow in the leg with the radioactive isotope Na^{24} is described. In 121 normal people the mean foot-groin flow time under standard conditions was $18 \pm 0{\cdot}9$ sec. The extreme range of the observations was 4–50 sec. The accuracy of the method is discussed and a comparison made with the findings by other methods of measuring rates of blood-flow.

GOLLWITZER-MEIER, K. (1950.) **Blood pH and blood-flow during muscular activity.**—*Lancet.* **258.** 381–386. **2690**

Determinations were made on the pH, oxygen capacity, lactic acid level, and the rate of blood-flow of the venous blood of the dog's gastrocnemius muscle stimulated electrically. The effect of various drugs was also determined. Some of the older theories were critically examined and the author considered that the data available did not justify correlation of the pH changes in the blood with definite processes of muscular metabolism.

—E. EDEN.

MCKEE, F. W., WILT, W. G., JR., HYATT, R. E., & WHIPPLE, G. H. (1950.) **The circulation of ascitic fluid. Interchange of plasma and ascitic fluid protein as studied by means of C^{14}-labeled lysine in dogs with constriction of the vena cava.**—*J. exp. Med.* **91.** 115–122. [Authors' summary copied *verbatim.*] **2691**

After plasma containing labeled plasma protein has been given intraperitoneally to dogs with experimental ascites a steady and rather rapid movement takes place of the labeled protein into the circulating blood. When plasma containing labeled protein has been injected intravenously into the ascitic dog the labeled protein steadily disappears from the circulating blood and appears promptly and steadily in the ascitic fluid. The period of complete exchange or turnover in either instance is measured in days (2 to 7), but many factors enter in and make for variation. Lysine labeled with radio carbon is incorporated into the plasma proteins by feeding the donor dog.

These experiments emphasize the ready exchange of proteins in the plasma with those in the ascitic pool and *vice versa.* This exchange may be termed circulation of ascitic protein.

VOSBURGH, G. J., & FLEXNER, L. B. (1950.) **Maternal plasma as a source of iron for the fetal guinea pig.**—*Amer. J. Physiol.* **161.** 202–211. [Authors' summary copied *verbatim.*] **2692**

Using radioiron as a tracer, the fetus of the guinea pig, during the last half of pregnancy, has

been demonstrated to receive sufficient iron from the maternal plasma to account for that incorporated during growth. It is unnecessary to assume that the fetus derives iron from maternal red blood cells during this part of gestation.

SCHMITT, F. O., & GEREN, B. B. (1950.) **The fibrous structure of the nerve axon in relation to the localization of "neurotubules".**—*J. exp. Med.* **91.** 499–504. [Authors' summary copied *verbatim.*] **2693**

In squid, frog, rat, and human nerves examined in thin sections with the electron microscope the axon contains, in addition to certain other particulates, characteristic filaments. These filaments have diameters ranging from about 100 to 200 Å and have indefinite length. They frequently have a nodose appearance due to the presence of discontinuities sometimes fairly regularly spaced along the filaments. This structure differs unmistakably from that of the dense-edged fibrils called "neurotubules" and it is clear that the latter are not axonic constituents. Though dense-edged fibrils can readily be demonstrated in fragmented formalin-fixed nerve preparations, they are seldom observed in thin sections. When such structures were seen in these experiments they were located in the connective tissue sheath. The present evidence offers no support for the view that "neurotubules" are structural entities of normal intact nerves.

EMMENS, C. W., & SWYER, G. I. M. (1948.) **Observations on the motility of rabbit spermatozoa in dilute suspension.**—*J. gen. Physiol.* **32.** 121–138. **2694**

In four semen specimens diluted progressively with Baker's solution to contain 20, 2·84, 0·41, and 0·06 million spermatozoa per ml., there was a highly significant fall in motility with progressive dilution. The same phenomenon occurred with chloride-free diluents as in the standard Baker's solution containing 2 g. per l. of sodium chloride; it was not therefore caused by the action of chlorides. Added catalase was ineffective in prolonging motility. Oil emulsions and spermatozoa-free supernatant liquid from other relatively dense suspensions in Baker's solution have considerable effect in maintaining motility, but this maintenance is not complete in comparison with controls at a higher concentration. Many other diluents were tried, the most effective being gum arabic, starch, glycogen, and serum proteins. Their action is not as effective as a concentrated suspension in Baker's solution.

Immobilization is almost certainly not due to the toxic action of traces of heavy metals. Repeated washing of a concentrated suspension results in a loss of motility which is regained on the addition of seminal plasma, the motility apparently depending upon the restoration of intracellular material.

—J. O. L. KING.

PRICE, D., MANN, T., & LUTWAK-MANN, C. (1949.) **Some metabolic effects of androgenic substances.**—*Nature, Lond.* **164.** 950–951. **2695**

The secretion of citric acid and fructose in the male accessory organs of reproduction is governed by the male sex hormone; the authors studied the effect of other sex hormones on this physiological function in the rat. Citric acid secretion by the female prostate gland was increased on treatment with testosterone propionate. Large doses of progesterone were also capable of increasing citric acid and fructose production in all accessory organs of male castrates. Similar results were obtained when these organs were transplanted into a female host treated with gonadotrophin.—E. EDEN.

RAWSON, R. W. (1949.) **The use of radioactive iodine in studying the pathologic physiology of thyroid disease.**—*J. clin. Invest.* **28.** 1330–1346. [Author's summary copied *verbatim.*] **2696**

Studies with radioactive iodine have resulted in major contributions to our knowledge of thyroid physiology, normal and morbid. Thus far the completed studies are in harmony with previous observations made with the conventional biochemical technics. However, because of the fact that with these technics, physiologic levels of study never before obtained are possible, we have been able to broaden our knowledge of thyroid disease at a level which could not otherwise be reached. With these technics we have been provided with better concepts as to (*a*) the actions of certain thyroid stimulators and inhibitors, (*b*) the function and biology of benign and malignant neoplasms of the thyroid, (*c*) a possible mode of action of the thyroid hormone on the tissues of the body.

It is suggested that these studies are only the beginning of new and intensive investigations on normal and morbid physiology of the thyroid which will not only lead to better understanding of thyroid disease but may also result in more intelligent and physiologic therapy of these maladies.

HILL, H. (1949.) Beitrag zur Histophysiologie der Schilddrüse nach Einwirkung thyreostatischer Substanzen (Methylthiouracil). [**The influence of methylthiouracil on the structure and function of the thyroid gland.**]—*Tierärztl. Umsch.* **4.** 377–379. **2697**

The average thyroid weight in g. pigs was 81·5 g. in the untreated controls, group (1); in those dosed daily with 0·05 g. methyl thiouracil for three months, it was 202·4 g., group (2); and in those dosed for the same length of time but killed five

weeks later it was 185·2 g., group (3). The colloidal follicles in group (2) were decreased in size, whereas those of group (3) were greatly increased. It is considered that this change is due to a compensatory mechanism after the withdrawal of the drug.

—E. Eden.

Bunting, H., & White, R. F. (1950.) **Histochemical studies of skin wounds in normal and in scorbutic guinea pigs.**—*Arch. Path.* **40.** 590–600. [Authors' summary copied *verbatim.*] **2698**

The occurrence of alkaline phosphatase and acid mucopolysaccharides has been studied in skin wounds of partially scorbutic and normal guinea pigs. The findings have been related to the state of fibroblastic proliferation and the formation of intercellular material. In general, healing was retarded in partial scurvy: the wounds contained immature-appearing fibroblasts and intercellular material which resembled that of earlier wounds of normal animals, being rich in reticulin and relatively deficient in collagen. The alkaline phosphatase of fibroblasts and intercellular material was absent or greatly reduced in the wounds of the scorbutic group, but there was no correlation between the amounts of this enzyme demonstrable and the collagen present in individual animals. Acid mucopolysaccharides were more abundant in the connective tissue of the wounds of partially scorbutic than in normal animals; and these mucopolysaccharides reacted to streptococcic and testicular hyaluronidases as to those in sites known to be rich in chondroitin sulfate.

Harvey, D. G., & Marchant, R. H. (1950.) **Studies on equine purpura haemorrhagica. Article No. 5—some biochemical aspects.**—*Brit. vet. J.* **106.** 162–172. **2699**

Serial examinations were made on the blood, urine, oedematous and peritoneal fluid of horses with purpura haemorrhagica. Among the many substances estimated were proteins (albumin, globulin, and fibrin), non-protein-nitrogen, and salts (calcium, inorganic phosphorus, and chloride). In one horse the fall in the blood albumin level was correlated with the appearance of albumin in the oedematous fluid, but otherwise no significant changes were observed. It is concluded that in this disease there is no indication of an abnormality in protein, carbohydrate, or fat metabolism, or in the mechanism of blood clotting.—E. Eden.

See also absts. **2622** (diet and bone structure); **2727** (environment and physiology, cattle); **2748** (book, enzymes); **2749** (book, metabolism).

PUBLIC HEALTH, VETERINARY SERVICES, AND VETERINARY EDUCATION

Cromb, E. E., & Murdock, C. R. (1950.) **An outbreak of food poisoning due to Salmonella dublin.**—*Med. Offr.* **82.** 267–268. [Abst. from authors' summary.] **2700**

A sharp, explosive, and circumscribed outbreak of food poisoning lasting about three days is described. The only article of food common to all the affected persons was the milk supply.

Evidence was obtained that a cow became sick and died from scour four days later, and that the milk from this cow on the first day of its illness had been distributed in the area in which all the cases had occurred.

The examination of bulk samples of milk and water in the search for salmonella is shown to be greatly helped by the method of Gell, Hobbs and Allison who originally used the method in the search for salmonella in sewage.

Geurden, L. M. G., Devos, A., & Devos, N. (1949.) Menginfecties in verband met Vleesvergiftigingen veroorzaakt door Salmonellae. [**Meat poisoning caused by the *Salmonella* group.**]—*Vlaam. Diergeneesk. Tijdschr.* **18.** 173–176. [English, French, and German summaries. Abst. from summaries.] **2701**

The authors describe a case of "meat poisoning" in which *S. enteritidis* var. *dublin* and *S. thompson* were both found. *S. dublin* was isolated from the meat of a calf affected with diarrhoea. The infection of the prepared meat by *S. thompson* probably took place after it had been cooked, but the origin of this infection was not discovered.

Brown, H. J., & Gibbons, N. E. (1950.) **Enterococci as an index of fecal contamination in egg products.**—*Canad. J. Res.* Sect. F. **28.** 107–117. [Authors' abst. copied *verbatim.*] **2702**

Enterococci were present in all samples of liquid and frozen egg products examined. They survived spray drying and storage in egg powder better than the coliforms and *Escherichia coli* and are therefore considered a better index of fecal contamination. There was no relation between the occurrence of *Salmonella* organisms and the number of enterococci present. *Streptococcus faecalis* was the species most commonly found. The addition of 0·5 % yeast extract to SF medium reduced the number of false negatives and improved the sensitivity, although confirmation on agar was still necessary. Winter and Sandholzer's medium, with bromocresol purple as indicator, could be used without confirmation but was not as sensitive for products containing small numbers of enterococci.

Gibbons, N. E. (1950). **Preservation of eggs. VII. Effect of age of egg and carbon dioxide content at time of oiling on keeping quality.**

—*Canad. J. Res.* Sect. F. **28.** 118–127. [Author's abst. copied *verbatim.*] **2703**

The quality of eggs oiled when one day old is maintained better than that of eggs oiled when 6 or 10 days old, the ages between which most commercial eggs are treated. If the pH of the albumen of the older eggs is lowered by exposure to carbon dioxide before oiling (a simple method of treating eggs with carbon dioxide is described), the keeping quality as measured by yolk index, albumen height, and percentage of thick albumen is improved. However, these differences are not apparent on candling, and on this basis the improvement does not justify the added cost of the gassing treatment.

INNES, J. R. M. (1950.) **The work of the Chemical-Biological Coordination Center in relation to chemotherapy in veterinary medicine.**—*J. Amer. vet. med. Ass.* **116.** 22–26. **2704**

The object of this organization is to assemble and tabulate the chemical and physical properties of compounds with biological activities; also to sponsor the preliminary testing of chemicals on animals and plants in order to determine the biological effects of these compounds. Reviews and abstracts of the literature are also prepared. The author discusses the usefulness of this type of service.—E. EDEN.

See also absts. **2479** (food-poisoning staphylococci); **2501** (cockroaches and food poisoning); **2579** (*Rickettsia burneti* in milk of sheep).

LIVESTOCK HYGIENE

PROMERSBERGER, W. J. (1948.) **Ventilation and insulation for farm buildings.**—*Bull. N. Dak. agric. Exp. Sta.* **10.** 195–199. **2705**

This is a short note on the ventilation of farm buildings, which P. considers often to be insufficient. It deals with cattle sheds, piggeries, and poultry houses. If this process of changing fresh air for foul is carried out in cold weather a great deal of heat is lost for the building, thus reducing the temperature too low. Animal heat is frequently the only heat supplied to animal habitations, and to ventilate adequately, the heat supplied by the animals must equal the heat lost through the ceiling, the wall, the ventilators, doors, windows, and so on. To help to maintain this heat balance storm doors, storm windows, weather stripping, and insulation in the walls and the ceiling are used. In order to do a good job of ventilating, a livestock shelter must be properly insulated.

The principles of ventilation are described and the following formula for ventilating cow sheds arrived at:

$$A = \sqrt{\frac{178}{H}}$$

where A equals sq. inches of flue cross-sectional area per 1,000 cow unit. H equals height in feet of top of flue above barn floor. Bulls are estimated at 2,000 lb., cows at 1,200, and calves at 300 lb. The total cross-sectional area of all inlets should be slightly more than the area of the out-take flue. Piggeries require 20 sq. inches per pig for outlets, each pig being assessed at 300 lb. For poultry houses the gravity system is used. Where electricity is available the fan system of ventilation is recommended and is discussed. Insulation in the walls and ceiling will greatly reduce the heat flow through the wall and ceiling area. An important factor in the use of insulation that is often overlooked is the use of vapour barriers to prevent moisture accumulating in the insulation. Water vapour is always present in the air and the vapour is under pressure.

Insulation and ventilation are dependent on each other for a proper performance. The ventilating system also helps to prevent accumulation of excessive moisture because moisture is carried out by the air that is removed, and drier air is brought in.—D. S. RABAGLIATI.

See also absts. **2616** (oestrogen in pasture plants); **2741** (report, New Zealand).

REPRODUCTION AND REPRODUCTIVE DISORDERS

HOLMES, C. R. (1950.) **Practical aspects of artificial insemination in Kenya.**—*Vet. Rec.* **62.** 2–4. **2706**

A review of the practical adaptation of artificial insemination technique required to suit conditions in Kenya. Choice of area is governed by the concentration of dairy farms within 15 miles radius, a minimum of 1,200 cows to be registered at the outset being desirable so that 750 cows can be inseminated in the first year. The African is not in general considered suitable as a competent lay inseminator; one inseminator is used for about 1,500 cows.

Certain local breeds may, through factors at present unknown, upset the success of the centre. All cows are examined prior to registration at the centre in order to eliminate as far as possible clinically diseased animals. In practice, many clinically normal cows fail to breed, while many abnormal animals do in fact breed. As a free ser-

vice to the district, the examination is both popular and valuable. Communities are encouraged to keep bulls of their own until the efficiency of artificial insemination has been proved in their herds.

A fee of forty shillings is charged for each cow diagnosed pregnant as a result of insemination. Animals sold before diagnosis are charged for as if pregnant. Inseminators therefore require skill in pregnancy diagnosis and routine examinations to confirm pregnancies are performed at 12 weeks or later, since 10 % of diagnoses at an earlier period were found incorrect.

The sub-centre is situated 273 miles from the central artificial insemination centre at Kabete, and semen is already 24 hours old and of about 80 % motility on arrival. Since infectious diseases may seriously disrupt the supply of semen from the central artificial insemination station, an emergency pool of bulls should be available locally, the semen from these bulls being used to supplement the more expensive transported samples for use in difficult cases. No Sunday service is provided, Sunday calls receiving priority attention on Monday. Carrier pigeons have been found useful for notifying the centre. The efficiency of each inseminator is now being separately recorded, but in 1948 an overall conception ratio of 2:3 services per conception was obtained after pregnancy diagnosis.

—D. H. L. Rollinson.

Bonadonna, T. (1948.) Organizzazione applicativa e successi della fecondazione artificiale in Francia. (Note ed osservazioni di viaggio.) [**Organization and success of artificial insemination in France. (Notes and observations of a tour.)**]—*Zootec. Vet., Milan.* **3.** 581–594. **2707**

An account of artificial insemination in France following a tour of French centres. Since March 1946 when this technique was first used in that country it had been widely applied, until at the end of 1948 there were about 30 centres, organized by cattle breeders in co-operative societies. The technique is stated to be identical with that used in other countries. B. discusses French State legislation on the subject, which he considers to be complete and up to date. Details are given of the work of two centres in particular, that of the "Société d'Elevage du Vexin" and that of the "Union des Coopératives d'Elevage de l'Yonne et du Loiret".

—B. Baldelli.

Machts, K. (1949. Die tierzuchthemmenden Krankheiten des Rindes und ihre Bekämpfung. [**Control of reproductive diseases of cattle.**] —*Wien. tierärztl. Mschr.* **36.** 437–453; & 526–539. **2708**

This is the first part of a general account of disease conditions which affect cattle breeding and contains a short introduction and a more detailed account of some diseases spread by coitus. The author writes of his experiences during 25 years as a practitioner and stresses the considerable increase in the incidence of reproductive disorders during that time. Whereas 25 years ago they hardly existed, today they account for every third bovine patient in his practice.

Infectious vaginitis and trichomoniasis are discussed in respect of diagnosis and treatment. Both diseases are considered harmless to the cow and of importance only by their effects on conception and pregnancy. It is suggested that infectious vaginitis deserves to receive more attention because it may predispose to other diseases.

In a second and final article M. discusses the control of anoestrus in cattle and pigs, contagious abortion, and also non-infectious diseases and anomalies of the genital organs. During the past 25 years there has been little change in the non-infectious group. M. considers that an ever increasing number of bulls and heifers used for breeding are affected with reproductive disorders and he recommends stricter measures of control of breeding stock, designed to meet the wide variety of farming practices in Austria. Artificial insemination is advocated for accessible farming areas and controlled natural service for outlying areas. State assistance is needed to build up a reserve of suitable bulls and to establish artificial insemination centres. Although infectious diseases of the genital organs seem most important at the present time it is considered that functional disorders of the pituitary, associated with efforts to force productivity beyond its proper limits, form the most serious long-term danger to cattle-breeding in Austria.—E. G. White.

Jaśkowski, L., Dobrowolska, D., Domański, E., Grycz, E., Gurlicki, A., Iwański, E., & Zalewska, E. (1949.) Badania nad stanem zdrowotnym buhaj licencjonowanych, ze szczególnym uwzględnieniem zakażeń przenoszonych w drodze aktu kopulacyjnego, oraz jakości nasienia. [**Examinations of bulls.**]—*Med. weteryn.* **5.** 904–908. [Abst. from English summary.] **2709**

An examination was made of the semen of each of 267 bulls, each animal having been examined clinically and submitted to a tuberculin test, a serological test for *Brucella* infection, and a microscopic and a cultural test for trichomoniasis. 126 were positive to the tuberculin test and 66 to the *Brucella* test. Trichomonads were found in sheath washings of 21 out of 198 bulls.

Shukla, D. D., & Bhattacharya, P. (1950.) **Studies on the semen characteristics of Indian breeds of livestock.**—*Indian J. vet.*

Sci. **19.** 161–170. [Authors' summary copied *verbatim.*] **2710**

Various semen characteristics of Kumauni hill, Sahiwal and Hariana bulls, Murrah and Murrah cross buffalo bulls, rams and goats have been studied.

The means and the average range of variations for each individual as well as for the representatives of the breeds and species considered have been worked out and presented.

EDMONDSON, J. E., TALLMAN, K. L., & HERMAN, H. A. (1949.) **A study of bacteria in bovine semen and their effect upon livability of spermatozoa.**—*Bull. Miss. agric. Exp. Sta.* No. 444. pp. 12. **2711**

Bacteriological studies were made on the semen of 36 bulls used exclusively for artificial insemination and having good conception rates. The following organisms, in order of predominance, were obtained: bacilli, micrococci, coliforms, haemolytic streptococci, non-haemolytic streptococci, *Pseudomonas*, *Actinomyces*, *Proteus*, and yeasts. Fresh semen having a high count of haemolytic bacteria showed decreased viability of spermatozoa as compared with samples with low counts. Adding microcci, yeast, and non-haemolytic streptococci to fresh diluted semen caused an appreciable increase in storage time, whereas all other organisms caused a decrease.

Total bacterial plate counts bore no relation to the storage time or to the fertility of the bull. Five bulls from which *Pseudomonas pyocyanea* was isolated had low fertility and eventually became sterile.

The mechanism by which bacteria increase or decrease the storage time of diluted semen could not be elucidated: bacteria-free filtrates had no effect, suggesting that it is products of bacterial growth which produce these effects.—E. G. WHITE.

HAKKESTEEGT, E. (1949.) Bevruchtingsresultaten van een stier met *Ps. aeruginosa* in het sperma. [*Pseudomonas aeruginosa* (*Ps. pyocyanea*) **in the semen of a bull and its effects on fertility.**] —*Tijdschr. Diergeneesk.* **74.** 297–300. **2712**

The semen of a bull used for artificial insemination was found to contain *Ps. pyocyanea.* Nevertheless the semen was of good quality and the conception rate of cows inseminated with it was quite satisfactory.—J. E.

PURSLEY, G. R., HERMAN, H. A., DICKENSHEET, M., & WATERS, R. E. (1950.) **A comparison of various semen diluters in maintaining motility of bovine spermatozoa.**—*J. Diary Sci.* **33.** 216–219. [Authors' summary copied *verbatim.*] **2713**

A comparison of the egg yolk-citrate diluent and the synthetic pabulum diluent with several modifications for preserving semen was made. A formula is presented for the preparation of a diluent for use in the artificial insemination of dairy cattle which appears, under conditions of these experiments, to support significantly greater livability of spermatozoa than previously suggested diluters.

PURSLEY, G. R., & HERMAN, H. A. (1950.) **Some effects of hypertonic and hypotonic solutions on the livability and morphology of bovine spermatozoa.**—*J. Diary Sci.* **33.** 220–227. [Authors' summary copied *verbatim.*] **2714**

A study was made of the effects of several hypertonic and hypotonic solutions on livability and morphology of spermatozoa. The freezing point depressions ranged from −0·19 to −1·05° C. The optimum range for spermatozoa survival was −0·44 to −0·61° C. in terms of freezing point depressions or 2·3 to 3·5 per cent. in terms of sodium citrate dihydrate concentration.

There appeared to be little difference in the spermatozoa head dimensions in the various hypertonic and hypotonic solutions. Coiled tails were observed in the two strongest hypotonic solutions and in the strongest hypertonic solution.

KOSIN, I. L., & WAKELY, W. J. (1950.) **Persistency of the functional capacity of breed-heterologous turkey semen.**—*Poult. Sci.* **29.** 258–263. [Authors' summary copied *verbatim.*] **2715**

When semen, obtained from the Broad Breasted Bronze toms, was repeatedly inseminated into the Beltsville Small White hens which only recently had been mating with the Beltsville Small White toms, the white down poults continued to appear, in some cases, for eight weeks following the removal of the white toms. The control hens received Beltsville Small White semen. Five weeks after the first insemination, the hen treatment groups were reversed, and observations were made on the down pattern of the subsequently hatched poults. The semen carried over from the first series of inseminations appeared to retain its fertilizing capacity for at least five weeks. If the white of the Beltsville Small White is *invariably* recessive to the bronze pattern of the Broad Breasted Bronze breed, then one must conclude that the fertilizing capacity of the turkey semen can persist for as long as eight weeks while within hen's oviduct.

NOVAZZI, G. (1948.) L'intradermo-reazione con colostro nella diagnosi di gravidanza della vacca. **[The colostrum intradermal test for diagnosis of pregnancy in cows.]**—*Atti. Soc. ital. Sci. vet.* **2.** pp. 267–274. [English and

French summaries. English summary slightly modified.] **2716**

The intradermo-reaction with colostrum in the diagnosis of pregnancy in the cow has not a practical clinical application.

JASPER, D. E. (1950.) **Prolonged gestation in the bovine.**—*Cornell Vet.* **40.** 165–172. [Author's summary copied *verbatim.*] **2717**

More than 30 cows in a well-managed Holstein herd have carried their calves past term. In cows allowed to enter parturition, recorded calf weights ranged from 105 to 168 pounds, and the time overdue from 20 to 88 days. Details regarding the hereditary nature of this condition will be published later as referred to in the text.

EDWARDS, J. (1950.) **Fertility in cattle: effect of *post-partum* interval. [Correspondence.]**—*Vet. Rec.* **62.** 310. **2718**

The conception rate to first service at varying periods of time *post partum* was analysed; figures for 11,685 cows, using natural mating, being available. There was a statistically very significant increase in the conception rate over the first three months: (0–30 days *post partum* 48·3 %, 30–60 days 62·5 %, 60–90 days 73·1 % conception). The month in which service occurred did not affect the result.

This result may in practice explain the differences previously thought to be attributable to the effect of the season, since farmers may try to regain 'lost' time by mating as soon as possible after calving.—D. H. L. ROLLINSON.

SINGH, S., & BHATTACHARYA, P. (1950.) **Inheritance of syndactylism in Hariana breed of cattle.**—*Indian J. Vet. Sci.* **19.** 153–159. [Authors' summary slightly amended.] **2719**

Eleven pedigrees showing both unilateral and bilateral congenital syndactylism of the forefeet only, in the Hariana breed of Indian cattle, have been reported and studied. All known carriers were normal and the expression of the character came to light as a result of inbreeding.

The data available are scanty but are indicative of the operation of an abnormal recessive mode of inheritance.

OBEL, A. L., SJÖBERG, K., & SANDSTEDT, H. (1950.) Om medfödd struma hos kalv i Sverige. **[Congenital goitre in calves in Sweden.]**—*Nord. Vet.-Med.* **2.** 491–507. [English and German summaries. English summary copied *verbatim.*] **2720**

The authors have determined the weight and iodine content of thyroid glands from 231 calves, from 0 days to 4 months old. From these weights, frequency curves are plotted for the age groups of 0–15 days and 16 days–4 months. The values found after the fall of the frequency curve are interpreted as representative of goitre. For both age groups a lower weight limit of 25 g. was found for goitre cases.

Histological examination was carried out on 77 thyroids weighing up to 25 g. from the age group of 0–15 days, and 43 thyroids from the group of 16 days–4 months. Of the first group 55 thyroids, of the second group 30 specimens showed a normal histological picture, whereas respectively 12 and 12 showed signs of hyperactivity. Of the goitre cases, 16 in the first group and 10 in the second group were examined; and all of them showed a picture of parenchymatous goitre. Comparison between the two age groups showed that the thyroids presented a less active picture in the older group; and this applies to the 'normal cases' as well as to the goitre cases.

Iodine analysis showed no definite difference between the two age groups. 76 % of the goitre cases had an iodine content under 30 mg. %, whereas 38 % of the "normal cases" fell under this value. Of the 34 thyroids weighing up to 25 g., which showed a histological picture of hyperactivity, 30 had an iodine content less than 30 mg. %.

In conformity with previous investigations, the outcome of the iodine analyses appears to show that iodine deficiency at any rate is not the only cause of parenchymatous goitre. A low iodine content may indicate that the thyroid has undergone some change. But for an estimation as to the possible presence of a pathological condition the weight and the histological examination are primarily decisive.

ROSENFELD, I., & BEATH, O. A. (1947.) **Congenital malformations of eyes of sheep.**—*J. agric. Res.* **75.** 93–103. **2721**

The authors conducted this examination of congenital abnormalities of eyes of sheep in the premiss that environmental, not specific teratogenic factors are responsible. A variety of conditions is described and histological examinations suggest that the structural misplacement occurred during early embryonic development.—C. W. OTTAWAY.

STEWART, W. L. (1950.) **Cerebellar atrophy in lambs. (Daft lambs.)**—*Vet. Rec.* **62.** 299–303. [Author's summary copied *verbatim.*] **2722**

An account of daft lamb disease as observed in the North of England is given with particular reference to the history of the flocks concerned. The specific lesions affecting the cerebellar cortex of "daft" lambs as described by Innes *et al.* were found. Alternative views on the etiology of this defect are examined and discussed and the suggestion is made that it may be essentially a manifestation of mineral malnutrition and preventable by

suitable supplementation of the pregnant ewes' diet.

INNES, J. R. M., & MACNAUGHTON, W. N. (1950.) **Inherited cortical cerebellar atrophy in Corriedale lambs in Canada identical with "daft lamb" disease in Britain.**—*Cornell Vet.* **40.** 127–135. [Authors' summary copied *verbatim.*] **2723**

An inherited disease of newborn lambs, identified as a form of cerebellar atrophy, was originally discovered in England. It occurred in different breeds.

An identical cerebellar disorder has been established in inbred Corriedale lines of sheep in Alberta, Canada. In the latter, the genetical aspect has been more fully traced and from this it is evident that a recessive gene with modifiers is responsible.

ROLLINSON, D. H. L. (1950.) **A case of bilateral testicular hypoplasia in the goat.**—*Vet. Rec.* **62.** 303–304. [Author's summary copied *verbatim.*] **2724**

A case of testicular hypoplasia in the goat is described. Details are given of semen character, size, weight and structure of the testicles and these are compared with semen characters in a fertile animal, and the size, weight and structure of the testicles from a normal male aged seven months.

PHILLIPS, R. (1949.) **An estimate of the quarterly calving rate of heifers in Welsh counties and the percentage annual replacements in the Principality. Part I. Calving rates. Part II. Estimated herd replacements. Part III. The method of calculation.**—*Brit. vet. J.* **105.** 351–369; 384–392; & 415–421. **2725**

I. From the returns of the Ministry of Agriculture, the quarterly rates of calving of in-calf heifers have been calculated. During the war period farmers were constantly urged to arrange the calvings of their herds so as to obtain a high percentage of autumn and early winter calvers and during the period 1941–47 most Welsh counties have increased the autumn calving rate in heifers. The most remarkable feature is the difference in the spring and autumn calvings in the various counties varying from 54·7 % in the autumn and 8·0 % in the spring in Caernarvon to 12·9 % and 50·1 % respectively in London. The winter and summer figures do not show wide variation.

It is highly probable that some of the differences between the autumn calving rates are closely related to differences in climate, of which the hours of bright sunshine during the period of conception (December to March) are probably the most important, but it is pointed out that the units which really need to be examined are not counties, but zones of similar elevation, climate, soil, and fertility.

Confirmation of this information is obtained from the percentage of dry cows as this indicates that where there is a high autumn rate of calving in heifers, there is a low rate of spring calving in herds. There has been a marked increase in the annual numbers of in-calf heifers in the Welsh Counties since 1940.

II. In Wales, there is very little importation of cows and heifers in milk, so the total herd intake is fairly accurately measured by the number of in-calf heifers, and from the Ministry of Agriculture returns of the calvings of heifers, it is possible to obtain a reasonably true record of the number of replacements. There was a higher average herd replacement from 1944–47 than from 1940–43 because the herds were increasing rapidly in size and so a higher intake was necessary to effect this build-up. The percentage herd replacement figures were 4·66 Dec.–Mar., 7·15 Mar.–June, 6·74 June–Sept., 7·15 Sept.–Dec., and these are lower than those quoted by Smith for the National Herd and lower than the wastage figures obtained by various workers. This may be attributed to the dual purpose nature of the Welsh Black and Shorthorn cattle with their satisfactory longevity and health status.

Apart from the border counties of Radnor and Monmouth, there was an annual reduction in the numbers of heifers under one year old reared in the Welsh counties during the five years 1943–47. In the more intensive dairying counties only one heifer calf is reared for every three cows, and there is considerable culling before the in-calf heifer stage. In all counties there was a considerable difference between the numbers of heifers under one year old and in-calf heifers on account of the selling of stores or fat heifers. With intensive dairying the minimum number of heifers is reared, and even in the counties with the highest proportion, approximately four heifers are reared to get three of them in calf, whilst in most of the Welsh counties, three heifers are reared to get two in calf.

As at the present rate of replacements it is necessary to rear only about half the heifer calves, only one quarter of the calves produced by artificial insemination are likely to become members of the dairy herds. Little is to be gained permanently by the attestation of "clean areas" unless marketing of young heifers is also efficiently developed.

III. The calculations were made from the quarterly returns of the Ministry of Agriculture for in-calf heifers, which have been collected since December 4th, 1939.

The method of calculation, which is described

in detail, is directed into three stages. First the calculation of the three-year totals of calvings of in-calf heifers, then the yearly total of calvings from the above, and then the quarterly total of calvings from the yearly and three-yearly totals as well as from the Ministry returns.

The method appears to be satisfactory particularly in areas where there is very little transfer of in-calf heifers, and the information obtained is supported by data from other sources, such as seasonality of calf sales, milk sales, and seasonal percentages of dry cows.—J. O. L. King.

See also absts. **2534** (F. & M. virus in bull semen); **2578** (*Rickettsia burneti* in placenta); **2631** (sex hormones and biotin deficiency); **2671, 2675–76** (sex hormones); **2741** (report, N. Zealand); **2742** (report, Brit. Guiana).

ZOOTECHNY

Rhoad, A. O. (1949.) **The development of dairy breeds for the tropics. Section vi. Subject 1.**—*Proc. XIIth Internat. Dairy Congr.* Stockholm. **5.** Suppl. pp. 199–202. [In English.] **2726**

In tropical regions cattle may be continuously housed, housed for milking and then pastured, or continuously pastured. In the first system high-grade cattle of temperate climate origin predominate, but for the other two systems cattle bred from temperate and cross-bred types are kept. Some of these local types combine high productiveness with a high heat tolerance, and are now evolving towards distinct breeds, and the author suggests that this tendency, hastened by the application of modern genetic techniques, will produce the future dairy breeds for the tropics.—J. O. L. King.

Ragsdale, A. C., Worstell, D. M., Thompson, H. J., & Brody, S. (1949.) **Environmental physiology, with special reference to domestic animals. IV. Influence of temperature, 50° to 0° F and 50° to 95° F, on milk production, feed and water consumption and body weight in Jersey and Holstein cows.**—*Bull. Mo. agric. Exp. Sta.* No. 449. pp. 23. [Authors' summary and abstract copied *verbatim.*] **2727**

Data are presented on the influence of ambient temperature, 4° to 95° F, on milk production, fat percentage, feed and water consumption, and body weight of twelve dairy cows, six in each, "Control" and "Experimental" chamber of the Climatic Laboratory. Lowering of temperature from 50° to 4° F increased feed consumption and butterfat percentage, but decreased somewhat the milk yield; rising temperature from 80° to 95° F depressed milk production, feed consumption, and body weight. Water consumption tends to parallel feed consumption, but, with great individual differences, tends to increase with increasing temperatures above 80° F. The effects of sudden lowering of temperature (from 50° to 4° F) on the Control or unacclimatized cows was found to be much more striking than on the Experimental or acclimatized cows.

The optimal temperature zone—quantity and efficiency—for milk production appears to be not far from 50° F, a statement that has to be substantiated. The critical high temperature is apparently 80° F; whereas no critical low temperature is evident, a gradual effect was observed. Rising temperatures are more detrimental to the Holstein cows and declining temperatures to Jersey cows. The effect of lowering temperatures below 50° F is much less for both breeds than the effect of rising temperatures above 50° F.

Krüger, G. (1949.) Die Bedeutung der Haarwirbel für die Signalementsaufnahme bei Trabern. [**Hair whorls in the identification of horses.**]—*Mh. Vet.-Med.* **4.** 147–151. **2728**

K. advocates the inclusion of hair whorls on identification documents of pure-bred German trotting horses. Apart from hair whorls occurring normally in certain regions of the body such as forehead, chest, flank, umbilical and hypogastric regions, of particular importance for identification are those situated in less usual regions and of unusual shape. Care should be taken to give an exact description of form and site.—E. G.

Lissot, G. (1948.) Chaponnage électrique et chaponnage hormonal. [**Caponization by electro-cautery and by stilboestrol.**]—*Bull. Acad. vét. Fr.* **21.** 361–364. **2729**

A bloodless method of surgical caponization is described, using an electro-cautery worked from a two-volt battery.

Hormonal caponization is performed by implanting a tablet of diethyl-stilboestrol in the nape of the neck, using a small trochar and a special implanter.—A. G. Singleton.

Thiéry, G. (1949.) Euthanasie du chien par l'électricité. [**Humane killing of dogs by electricity.**]—*Rec. Méd. vét.* **125.** 113–114. **2730**

Electrical euthanasia has proved superior to any other method for the destruction of dogs. The electrodes can either be of the insulated pincer type or two leather collars each with a 4×1 cm. copper plate connected to the electric supply. One collar is placed above the elbow and the other above the opposite hock. The electrode sites are moistened with water or with concentrated sodium carbonate solution which removes fat and gives a

better contact with the skin. A current of 220 volts is sufficient to cause arrest of the heart. This occurs 2 sec. after the current is switched on but its duration should be for 30 to 40 sec. It is unnecessary to insulate the animal from the ground.—J. A. NICHOLSON.

CAMPBELL, J. A. (1950.) **Use of anaesthesia in treatment of zoo inmates.**—*Canad. J. comp. Med.* **14.** 39–41. **2731**

A discussion of methods of anaesthesia employed in the Toronto Zoological Collection. Lions and tigers are coaxed into a "shifting den" which is closed with tarpaulins. Chloroform is squirted into the den and after the fourth pound the patient usually drops to the floor. Chloroform on cotton-wool is then held close to the nose until anaesthesia is complete. Deer, which are most difficult to handle, are treated in a similar manner in a large shipping crate. Ether or a local anaesthetic is used for birds. Morphine is preferred for canines and nembutal for medium and small felines. The most gratifying feature with lions is that the patient has no recollection of what happened and harbours no resentment.—R. GWATKIN.

JONES, J. I. M., & WOOD, E. C. (1949.) **The housing of laboratory animals.**—*J. Hyg., Camb.* **47.** 190–196. **2732**

This account is based on a survey of British establishments and provides much useful information. Consideration is paid especially to rats and mice, but the article should be consulted by those contemplating the erection of any type of small animal house.—K. G. TOWERS.

GRIDGEMAN, N. T. (1949.) **Record keeping for laboratory animals.**—*J. Hyg., Camb.* **47.** 197–201. **2733**

G.'s system of management of a rat colony is described along with a concise method of recording reproductive details which allows easy access to essential information. Breeding can then be planned on sound genealogical grounds and the output of the colony gauged to meet demand. —K. G. TOWERS.

FULLER, J. L., EASLER, C. A., & BANKS, E. M. (1950.) **Formation of conditioned avoidance responses in young puppies.**—*Amer. J. Physiol.* **160.** 462–466. [Authors' summary copied *verbatim.*] **2734**

Twenty-five newborn puppies have been tested for conditioned avoidance responses to electric shock applied to the forelegs, using sound, light, odor and contact as conditioned stimuli. Receptors for odor and contact appear to function at birth, for light at about 16 days, and for sound at about 19 days. However, the age at which stable CR's [conditioned reflexes—Ed. *V.B.*] developed to sound, light and odorous stimuli was from 18 to 21 days in all cases. Control puppies, not subjected to the conditioning procedure until 20 days of age, form CR's readily when training is commenced. CR's to contact were not produced by our technique. The time of appearance of conditionability corresponds to the beginning of the "critical period" of social development postulated by Scott [*J. Genet. Psychol.* In press], and to the changes in reflex patterns described by Bahrs [1927].

See also absts. **2741** (report, New Zealand); **2742** (report, Brit. Guiana); **2750** (book).

TECHNIQUE AND APPARATUS

WILSON, A. T., & BRUNO, P. (1950.) **The sterilization of bacteriological media and other fluids with ethylene oxide.**—*J. exp. Med.* **91.** 449–458. [Authors' conclusions copied *verbatim.*] **2735**

Ethylene oxide is an effective sterilizing agent for bacteriological broths, milk, and serum. A short time after it has exerted its sterilizing effect, the treated fluids again become capable of supporting bacterial growth. Ethylene oxide has been shown to destroy a number of aerobic Gram-positive and Gram-negative organisms, aerobic and anaerobic spore-forming bacilli, fungi, and vaccinia virus. No organisms have been encountered which withstand its action. The quantity of ethylene oxide necessary for sterilization depends to some degree on the character of the medium sterilized. None of the materials tested required more than 1 volume per cent of liquid ethylene oxide. Ethylene oxide is highly reactive chemically, and its reactions with many of the components of complex biological fluids cannot be fully anticipated. Regardless of the chemical changes produced, ethylene oxide did not permanently alter the essential qualities of the growth factors in broth and milk which are required by fastidious organisms such as group A streptococci and others. However, its effect on the biological activity of any particular organic compound should be assayed before it can be assumed not to have a deleterious effect. The sterilization of media by ethylene oxide is accompanied by a rise in pH. Fluids which have a relatively high initial pH may require adjustment with sterile acid to return them to the optimal pH for bacterial growth. A mixture of ethylene oxide and broth was toxic to mice for 6 hours after admixture. Toxicity disappeared on incubating the mixture longer, and no residual toxicity could be demonstrated after 6 hours, even on repeated intraperitoneal inoculations. As a

means of sterilizing bacteriological media and other biological fluids, ethylene oxide deserves consideration when heat and filtration cannot be used.

ZELJKO, M. (1949.) Metoda za pretražlvanje krvi na durinu i sakagiju vezanjem komplementa u istoj epruveti. [**Simultaneous complement-fixation test for dourine and glanders.**]—*Vet. Arhiv.* **19.** 243–246. [English and German summaries. Abst. from English summary.] **2736**

A report on the use of the complement-fixation test simultaneously for glanders and dourine in the same tube, antigens being added to each tube. Upon completion of the test all positive and doubtful tubes are examined separately for dourine and glanders. Using this method Z. examined 36,480 serum specimens in an area where both diseases occurred. Eight positive and two doubtful cases of dourine, and six positive and two doubtful cases of glanders were detected.

REES-WRIGHT, W. (1949.) **A further note on mounting media for parasitological materials.**—*Ann. trop. Med. Parasit.* **43.** 373. **2737**

Blood films of protozoa infections stained with Leishman's stain and mounted in euparal about 25 years ago were found to be in excellent condition when examined, as compared with other slides mounted in a camphenol-sandarac medium.

—GEORGE M. URQUHART.

GOLDMAN, M. (1949.) **An iron alum-picric acid-hematoxylin stain for parasites in tissues.**—*J. Parasit.* **35.** 36. [Only abst. given, copied *verbatim.*] **2738**

A staining technique for tissues is presented which yields critical results comparable to those achieved by Heidenhain's iron hematoxylin method but which eliminates the troublesome step of destaining.

The following schedule may be used: Remove paraffin from sections and hydrate in usual manner. Mordant in 4 % iron alum solution for 20 minutes or more at room temperature. Wash in running water for 10 minutes. Transfer to a 1:1 mixture of saturated aqueous picric acid and 0·1N HCl for 3 hours or more at 37° C. Rinse in distilled water for 1 minute. Stain in ripened 0·5% hematoxylin for 2 hours or more at 37° C. Wash in running water for 30 minutes. Dehydrate and mount in the usual manner. Longer time periods for steps 2 and 4 do not affect final results very much; extended staining in hematoxylin may yield dense preparations but gross blackening does not occur.

The above procedure has given excellent results with *E. histolytica* in colon and *L. donovani* and *T. cruzi* in spleen, liver and heart fixed in formalin, Bouin's and Zenker's fixatives.

See also abst. **2516** (preparation of *T. equiperdum* antigen).

KULONEN, E. (1950.) **A histochemical method for determination of hyaluronic acid.**—*Acta path. microbiol. scand.* **27.** 461–472. [In English. Author's summary copied *verbatim.*] **2739**

Experiments have been made by the author to demonstrate tissue polysaccharides histochemically and a method of demonstrating hyaluronic acid by using bacterial hyaluronidase is described. This method is based on formation of reducing substances which are stained with silver solutions avoiding other reducing agents.

Reducing substances produced enzymatically from hyaluronic acid do not react with fuchsin sulphurous acid.

GABARDI, A., & DAVENPORT, H. W. (1949.) **An improved device for obtaining plasma anaerobically.**—*J. Lab. clin. Med.* **34.** 1169–1170. **2740**

Blood is drawn into the syringe and centrifuged therein, the barrel being prevented from slipping down over the plunger by a spacer which is illustrated. The nozzle is sealed by pushing it into a short rubber tube, the other end of which is plugged. To remove the plasma, the plug is taken out and replaced by the tip of a blood gas pipette and the plasma is forced into the pipette.

—L. M. MARKSON.

REPORTS

NEW ZEALAND. (Undated.) **New Zealand Dairy Board. Twenty-fifth Annual Report and Statement of Accounts for period of 12 Months ended 31st July, 1949.** [ANON.] pp. 83. Items of veterinary interest, pp. 13, 55, 58, & 68. Wellington: New Zealand Dairy Board. **2741**

The Director of Herd Improvement reports on dairy herd testing and related investigations. In addition to the usual testing statistics there are reports on: Herd improvement through breeding; Production Survey of A.I bred cows; Investigation of milking technique; Field Survey of mastitis response to penicillin; and Calf Wastage Survey.

—J. F. FILMER.

BRITISH GUIANA. (1949.) **Administration report of the Director of Agriculture for the year**

1946. [Croucher, H. H.] pp. 19. Items of veterinary interest, p. 6. East Demerara: The Argosy Company Ltd. **2742**

There was no serious outbreak of disease. Equine Trypanosomiasis, which caused serious losses in 1945–46, has practically ceased. Only three cases were found during the last quarter of 1946.

The 1946 census of livestock shows cattle 162,800; oxen 26,600; horses 2,500; mules 1,600; donkeys 8,700; pigs 34,600; sheep 48,000; goats 17,400; rabbits 700; fowls 420,700; turkeys 5,500; ducks 57,300. There is need for great expansion in milk production.

Cattle slaughtered in Georgetown in 1946 were 8,098 head. 3,163 of these came from the Rupununi District by the cattle trail. 1,500 bullocks were imported from the Rio Branco territory of Brazil. Local sugar estates supplied 877 beef animals.

Pigs slaughtered in Georgetown were 14,997, a rise of 2,000 on the previous year. The sugar estates reduced the numbers of their pigs. Processing of bacon, ham, and other meats was continued by the Demarara Meat Company.

The Government Stock Farm, Georgetown, had 87 cattle, including 11 bulls, 27 cows, 22 heifers, and 27 calves. 23 calves were born during the year (3 still-born). Milk production from 24 cows was 12,050 gallons. The bulls were 6 Holstein, 1 Guernsey, 1 zebu, and 1 Grade Holstein.

At Ebini in the intermediate savannahs an experimental station is being maintained to study the economic possibilities of these minerally deficient pastures for cattle rearing. A breeding-station is also being established at St. Ignatius in the Rupununi. Buildings were in course of erection.

District stud units maintained 23 Government-owned bulls which gave 1,973 services. There were 4 rams and 5 ram lambs, 7 ewes and 4 ewe lambs. Routine dosing for parasites and treatment of foot trouble were necessary. A Skin Disease of Sheep affecting the head at first was investigated by the Government Bacteriologist but no diagnosis had been made. Other breeding-stock maintained were goats, donkeys for mule breeding, rabbits, and poultry.

Poultry diseases mentioned are Coccidiosis, which was completely checked by using sulphamerazine, and Curly Toe Paralysis, successfully treated by adding vitamin B to the ration.

—J. A. Griffiths.

BOOK REVIEWS

Eddy, W. H. [Ph.D. Emeritus Professor of Physiological Chemistry, Teachers' College, Columbia University. (1949.) **Vitaminology. The chemistry and function of the vitamins.** pp. v+365. London: Baillière, Tindall & Cox. 46*s*. 6*d*. **2743**

This text-book is intended for the use of students and others who require a general view of the subject of vitamins, their chemistry, physiology, and value in human and animal nutrition. For each well-established vitamin there is a chapter divided into three main sections with sufficient documentation to guide the searcher to further information on the subject if he wishes to specialize in some particular field. It is stated in the introduction that the papers selected for reference and discussion in the text are primarily intended to lead the student towards new problems and in no way to be considered as a full bibliography of the subject.

The substances antagonistic to certain vitamins and the known anti-vitamins are dealt with in their appropriate sections with the most recent information on their chemical nature and pathological effects.

The inclusion of notes on the animal protein factor, vitamin B_{12}, vitamin B_{14}, and some other less well-defined vitamins makes this the most complete and up-to-date text available for students and others who have not time to read the ever increasing volume of literature on vitamin studies.

The text is somewhat marred by numerous small errors, but these should not detract from the general usefulness of the book.—A. M. Copping.

Shafar, J. [M.D., M.R.C.P., D.P.H.] (1949.) **The vitamins in medical practice.** pp. 383. London: Staples Press Ltd. New York: Staples Press Inc. 1st. Edit. 25*s*. **2744**

The introductory chapters of this book give a summary of the essential knowledge of the chemistry and physiology of the known vitamins, with some details of human requirements and diagnosis and treatment of deficiency conditions. Two chapters are devoted to the effects of cooking, canning, and fermentation processes on the vitamin content of foodstuffs, and to biosynthesis of vitamins in animals and man and to the toxicology and pharmacology of the vitamins. The various syndromes established as due to deficiency of vitamin B_1, other members of the vitamin B complex, vitamin C, and vitamin D are described and discussed. More than half the book is then given over to the discussion of the role of vitamins in a wide variety of diseases. The clinical fields covered include haematology, neurology, endocrinology, cardiovascular disease, hepatic lesions, dermatology, and rheumatic affections.

An enormous amount of information is packed into the book and an appendix provides additional data on recent work on vitamin B_{12}, folic acid, vitamin E in heart disease, rutin, and vitamin P. The list of 1,684 references indicates the scope of the work which tends in some parts to become a catalogue of facts and references rather than a well-digested survey of the subject under discussion. It is, however, a valuable source of information for the clinician and the advanced student and the contents are adequately indexed to help the reader in search of specific items.
—A. M. Copping.

Volker, R. [Prof. Dr.] (1950.) Eugen Fröhner Lehrbuch der Toxikologie für Tierärzte. [**Eugen Fröhner's textbook of toxicology for veterinarians.**] pp. xx+404. Stuttgart: Ferdinand Enke. 6th Edit. DM. 35.60 bound. **2745**

The fifth edition of this book was prepared 22 years ago by Fröhner and in revision his successor has brought the material up to date, without increasing the number of pages—an economy measure necessary in order to keep to the stated price. As there was much new matter to bring in, the revision has had to be drastic and the entire text condensed to essentials. All this has been done with great success so that this new edition is a tightly packed store of facts about animal toxicology with emphasis on the practical aspects.

Besides a section on general toxicology there are sections on special toxicology—inorganic compounds, organic compounds, poisonous plants, and poisonous animals. The important synthetic organic drugs are well represented with reference to those of German origin. Selected references appear at the ends of the sub-sections devoted to individual plants, groups of chemical compounds, etc.

This book is probably the best modern treatise on "veterinary toxicology" and it is particularly well arranged for ready reference, having a detailed list of contents and index. The paper and printing are both very good and the binding strong and handsome.—J. E.

Voegtlin, C. [Ph.D. Formerly Chief of the Division of Pharmacology, National Institute of Health, U.S. Public Health Service.] & Hodge, H. C. [Ph.D. Professor of Pharmacology and Toxicology, School of Medicine and Dentistry, University of Rochester.] (1949.) **Pharmacology and toxicology of uranium compounds. With a section on the pharmacology and toxicology of fluorine and hydrogen fluoride. Parts I & II.** pp. xvii+1084. New York, Toronto, London: McGraw-Hill Book Co. Inc. 1st Edit. 85*s*. **2746**

This book is the record of research directed by the United States Atomic Energy Commission, the main purpose being to determine the amount of uranium that can be handled with safety by workers in factories and laboratories. The best possible precautions to be taken and the type of therapeutic agents to be used in case of an accident were also studied, most of these tests being done on laboratory animals, but human beings working with uranium were regularly submitted to medical examinations. As a result of these measures no specific chronic injuries during the period of observation were noted in the workers.

The chemistry of uranium compounds and the analytical and statistical methods used in this study are first described. The next two chapters deal with the characteristics of uranium poisoning. This is followed by discussion of the level of toxicity of the various uranium compounds when they are applied to the skin or eye, inhaled, injected, or parenterally administered. The distribution and excretion of uranium, the mechanism of its action in the body with particular reference to enzymes and proteins are also described.

Part II is concerned with the pharmacology and toxicology of fluorine and hydrogen fluoride.

From the result of these studies, it was found that 150 μg. of uranium dust per cu.m. of factory air was a safe limit. Most of the uranium absorbed by the body was either excreted or deposited in the bones. Uranium compounds very readily formed complexes with carboxyl groups (*e.g.* with bicarbonates, citrates, and proteins). They were carried in this form in the blood and probably excreted thus in the urine. The main pathological damage observed was in the kidneys, probably caused by the complex formation of the toxic compound with the proteins of the cells. Cellular damage in its turn led to an altered excretion pattern of many compounds. The presence of catalase, a component of kidney cells and normally absent from the urine, proved to be the best clinical test for uranium poisoning.

The book not only contains a great deal of specialized information, but also much material of general interest (*e.g.* normal variation of blood constituents in several species), and as it is written in a lucid style, it will make interesting reading for a wider circle than those interested purely in atomic energy. It is also a tribute to team work in research which achieved results in a comparatively short time.—E. Eden.

Fröhner, E. [Revised by.] Reinhardt, R. (1950.) Lehrbuch der Arzneimittellehre für Tierärzte. [**Textbook of veterinary pharmacology.**] pp. xii+400. Stuttgart: Ferdinand Enke. 18th Revised Edit. DM. 27. **2747**

This standard German veterinary text-book

on materia medica and therapeutics has been brought up to date by this new edition, which reflects the continued development of change from the use of medicines of plant origin towards those made by chemical synthesis, apart from antibiotics, which are still mostly produced by natural biological processes.

The text is arranged in functional groups (laxatives, anthelmintics, and so on) and is comprehensive, although information on individual drugs is often very brief.

The standard of previous editions has been well maintained and the paper and binding are good and adequate.—J. E.

DIXON, M. [Ph.D., Sc.D., F.R.S.; Reader in Enzyme Biochemistry in the University of Cambridge.] (1949.) **Multi-enzyme systems.** pp. 100. Cambridge: University Press. 7*s*. 6*d*. **2748**

This book gives the subject-matter of four lectures delivered by the author and contains much new and hitherto unpublished material. He describes in a lucid manner how enzymes are functionally coupled together to form systems of enzymes and he gives examples of some of the processes which such systems can bring about. Those of most vital importance are the energy-yielding reactions and the transfer and use of this energy for other processes. Representative examples of these two types of reaction are hydrogen and phosphate transfer; and these two are discussed in detail and are used to illustrate many properties of multi-enzyme systems.—E. EDEN.

REIFENSTEIN, E. C., Jr., M.D. [Edited by.] (1949.) **Metabolic interrelations. Transactions of the First Conference February 7–8, 1949, New York, N.Y.** pp. 193. New York: Josiah Macy, Jr., Foundation. **2749**

This book is a report, almost *verbatim*, of a two-day conference at which 25 American scientific workers presented short papers on metabolic studies in which they had been engaged. Each paper was discussed informally and these discussions are published in full; they are interesting in that they bring out details of technique which the authors had not thought worth presenting in their papers. Much information relevant to each paper is supplied in comments during the discussion by workers in slightly different fields.

The agenda concentrated mainly on bone metabolism and the steroids. There are eight papers on the former and four on the latter; the two subjects are bridged by a paper on the effect of steroid hormones on bone. The other subjects covered are the metabolism of radio-active carbon (C^{14}) and of radio-active calcium (Ca^{45}), investigation of a gastric secretion inhibitor, of gastric HCl formation and of ketone-body formation; there are two papers on ACTH (adrenocorticotrophin), the first covering its effects on mineral excretion and the second dealing with the metabolic action of ACTH on certain pathological syndromes; there is a paper on the carbohydrate cycle and an interesting and unusual paper on the source and transference of energy in intracellular reactions.

Biochemists who have any interest in the subjects covered should read this book; the discussions illuminate the whole report, enabling even the non-specialist reader to form a judgement on the relative value of each contribution.

—F. B. LEECH.

KOCH, P. [Revised by.] (1949.) STANG. Über Konstitution und Erbfehler sowie deren Feststellung und Bewertung beim Zuchttier. [**Stang's constitution and hereditary defects of domesticated animals.**] pp. 99. Berlin: Richard Schoetz. 3rd Edit. DM. 5.60. **2750**

This small and inexpensive book was written for veterinary surgeons and students as a guide to the recognition and significance of constitutional and hereditary defects in animals selected for breeding purposes. The method of examining the animal is described and the signs of health and disease in each species are listed. Hereditary defects are grouped into four classes: minor defects, major defects, hereditary diseases, and lethal factors. Defects vary from mere blemishes of no significance to defects which indicate serious consequences for the offspring. When considering whether an animal is suitable for breeding purposes, the veterinarian is advised to pay attention only to those defects which are considered likely to weaken health, performance, or constitution of the progeny.

"Hereditary diseases" are in the main conditions which are believed to be transmitted to the offspring in the form of an inherited predisposition to the disease in question. The author states that in the horse the only known inherited disease is epistaxis in thoroughbreds: most of the so-called hereditary diseases are conditioned by environmental factors, the exact significance of which is not known. An appendix of 22 pages lists the desirable, undesirable, and constitutional defects of the various species of domestic animal.

The author of the revised edition has retained the form and scope of the original editions but has incorporated his own views of some defects which are often considered to be hereditary. The illustrations show the effects of nutrition and constitution: the number of plates could with advantage be increased. There are no lists of references to published work.—E. G. WHITE.

BOOKS RECENTLY RECEIVED

Notice of recently received books in this list does not preclude review.

BERNKOPF, H. (1948.) **Report on bovine leptospirosis in Palestine submitted to the Agricultural Research Committee by the Government of Palestine Board for Scientific and Industrial Research.** pp. 23. Jerusalem: The Hebrew University. 100 mils (2*s*.) Amsterdam: North Holland Publishing Co. Fl. 1.20.

CLIFTON, C. E., RAFFEL, S., & BARKER, H. A. (1949.) **Annual review of microbiology.** pp. 476. Stanford, California: Annual Reviews, Inc. Vol. III. $6.00.

DEL CONTE, E. (1949.) Contribución del coeficiente citológico a la fisiología y patología de la correlación hipofisotiroidea. [**Cytology as a means of determining the relationship of the pituitary gland to the thyroid.**] pp. 87. Buenos Aires: Libreria y Editorial el Ateneo.

EGGERT, O. K. (1950.) Physikalische Tiermedizin. [**Physiotherapy in veterinary medicine.**] pp. xii+187. Stuttgart: Ferdinand Enke. Vol. I. Unbound DM. 24. Bound DM. 26.80.

FISCHER, A. (1949.) Das Klauenbeschneiden der Rinder. Ein wichtiger Zweig der Klauenpflege. [**Care of claws in cattle.**] pp. 72. Hannover: M. & H. Schaper. 10th Edit. DM. 2.80.

FREI, W. (1950.) Tierseuchen. [**Infectious diseases of animals.**] pp. 317. München/Basel: Ernst Reinhardt. Unbound Sw. fr. 8.80. Bound Sw. fr. 11.

GLÄSSER, K., HUPKA, E., & WETZEL, R. (1950.) Die Krankheiten des Schweines. [**Diseases of pigs.**] pp. 481. Hannover: M. & H. Schaper. 5th Edit. DM. 27.

HEDIGER, H. (1950.) **Wild animals in captivity.** pp. ix+207. London: Butterworths Scientific Publications. 35*s*.

HENDERSON, G. (1950.) **Farmer's progress. A guide to farming.** pp. 230. London: Faber & Faber, Ltd. 10*s*. 6*d*.

KOEGEL, A. (1950.) Nutztierparasitologie für Tierärzte, Landwirte und Nutztierhalter. [**Livestock parasitology for veterinarians, farmers and breeders.**] pp. vii+339. Stuttgart: Ferdinand Enke. Unbound DM. 30. Bound DM. 32.70.

LACROIX, P. (1949.) L'organisation des os. [**Bone growth.**] pp. 230. Paris: Masson & Cie. Fr. 900.

LEUTHOLD, A. (1949.) Grundriß der Allgemeinen Chirurgie und Operationslehre. [**General surgery.**] pp. 200. München/Basel: Ernst Reinhardt. Unbound Sw. fr. 7.60. Bound Sw. fr. 9.80.

LEVER, W. F. (1949.) **Histopathology of the skin.** pp. xv+449. Philadelphia, London & Montreal: J. B. Lippincott Co. 80*s*.

OYTUN, H. S. (1945.) Genel Parasitoloji ve Helmintholoji. [**General parasitology and helminthology.**] pp. xix+636. Ankara: Yüksek Ziraat Enstitüsü Basimevi.

PRATT, R., & DUFRENOY, J. (1949.) **Antibiotics.** pp. xi+255. Philadelphia, London, & Montreal: J. B. Lippincott Co. 40*s*.

REINHARDT, R. (1950.) Lehrbuch der Geflügelkrankheiten. [**Textbook of poultry diseases.**] pp. 384. Hannover: M. & H. Schaper. 4th Edit. DM. 22.

RICHARDSON, C. (1950.) **Practical farriery. A guide for apprentices and junior craftsmen.** pp. xi+74. London: Sir Isaac Pitman & Sons, Ltd. 8*s*. 6*d*.

RULLIER, J. (1948.) Le laboratoire du praticien vétérinaire. [**A veterinary practitioner's laboratory.**] pp. 176. Paris: Givot Frères.

SCHÄPER, W. (1949.) Die Verbesserung der Konstitution unserer Haustiere. [**Improvement of constitution in domestic animals.**] pp. 57. Berlin & Hamburg: Paul Parey. DM. 3.

SCHARRER, K. (1950.) Die biochemischen Grundlagen der Tierernährungslehre. [**Biochemical principles in animal nutrition.**] pp. viii+162. Stuttgart: Ferdinand Enke. DM. 12.80 or DM. 14.

SEXTON, W. A. (1949.) **Chemical constitution and biological activity.** pp. xxi+412. London: E. & F. N. Spon Ltd. 55*s*.

WELLS, B. B. (1950.) **Clinical pathology. Application and interpretation.** pp. xi+397. Philadelphia & London: W. B. Saunders Co. 30*s*.

ANON. (1948.) Législation des aliments des animaux. [**French law concerning feeding-stuffs for animals.**] pp. 63. Paris: Fédération Nationale des Syndicats des Industries de l'Alimentation Animale. Fr. 100.

INDEX VETERINARIUS

The publication of *Index Veterinarius* commenced with the indexing of the literature of 1933. It is a complete index of current publications relating to veterinary research, public health, administration, education, and other aspects of veterinary science.

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TECHNICAL COMMUNICATIONS, ETC.

Commonwealth Bureau of Animal Health, Weybridge.	
Review Series No. 2. Modes of Spread of *Streptococcus agalactiae* Infection in Dairy Herds. A report on co-ordinated observations by the Agricultural Research Council of the United Kingdom. May, 1944	3*s*. 0*d*.
Commonwealth Bureau of Animal Nutrition, Aberdeen.	
15. Minerals in Pasture. Deficiencies and excesses in relation to animal health. By F. C. Russell. May, 1944	5*s*. 0*d*.
16. Diet in Relation to Reproduction and the Viability of the Young. Part 1. Rats and other laboratory animals. August, 1946	6*s*. 0*d*.
Commonwealth Bureau of Animal Breeding and Genetics, Edinburgh.	
The Semen of Animals and its Use for Artificial Insemination. By James Anderson. Spring, 1945	7*s*. 6*d*.
Commonwealth Bureau of Pastures and Field Crops, Aberystwyth.	
36. The Grasslands of Latin America. By Miss G. M. Roseveare. Late 1946.	20*s*. 0*d*.
38. Advances in Grassland Husbandry and Fodder Production. Second symposium. Late 1946	6*s*. 0*d*.
Commonwealth Bureau of Plant Breeding and Genetics, Cambridge.	
The New Genetics in the Soviet Union. By P. S. Hudson and R. H. Richens. May, 1946	6*s*. 0*d*.
Commonwealth Bureau of Soil Science, Harpenden.	
43. Land Classification for Land-use Planning. June, 1946	4*s*. 0*d*.
Commonwealth Mycological Institute, Kew.	
An Annotated Bibliography of Medical Mycology, 1945. 1946.	5*s*. 0*d*.

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